

form based codes . carbon conscious design . compact urban design . stormwater management . mass transit . walkability . sustainability .

# REED STREET YARDS . model development . MILWAUKEE

car sharing . food production . open space . job development . economic center . sustainable lifestyle . solar power

**a true model development for an urbanizing planet .**



# REED STREET YARDS MILWAUKEE, WISCONSIN

A Design Thesis Submitted to the  
Department of Architecture & Landscape Architecture  
of North Dakota State University

By:

Bryan Leininger

In Partial Fulfillment of the Requirements  
for the Degree of  
Bachelors of Landscape Architecture

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Primary Thesis Advisor

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May, 2011  
Fargo, North Dakota





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Name: BRYAN LEININGER Date: 5/6/2011

“Half of the world's population currently lives in cities. By 2050, 70% of the world will live in cities and 97% will live within a day's journey of a city. That means that approximately 200,000 people will move or be born in a city every single day.”

**Alex Steffen**, Co-founder and editor  
of [worldchanging.org](http://worldchanging.org)

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# THESIS ABSTRACT

This project is meant to explore the idea of low carbon development in cities post global peak oil. Milwaukee, like many other Rust Belt cities across the United States, has passed its industrial peak and today is left with an abandoned, misused, and scarred landscape. Much of the southwestern side of Milwaukee is scattered with sites in this exact situation. The site that will be studied lies along the Menomonee River, adjacent to the booming Third Ward.

Many of the decrepit industrial structures from the site have either been torn down or are in the process of being repurposed and rehabilitated. Besides these structures, the site is completely abandoned and unused. The goal and vision of this study is to create a low carbon model development which can be used in cities across the United States. With proximity to rail, water and existing bike path infrastructure, the new vision will influence people to use alternative low carbon modes of transportation. All new structures and site design elements will follow a low carbon code and policy system to ensure definite sustainability.

# THESIS PROBLEM STATEMENT

How can low carbon development post global peak oil promote vitality and healthy living in inner city Milwaukee and become a model for cities across the United States?

# STATEMENT OF INTENT

## **THE PROJECT TYPOLOGY**

The vehicle for studying this thesis idea will be a low-carbon development adjacent to major amenities that lend themselves to lifestyle improvements for people living in this location. The project typology would become a development model for cities across the United States.

## **THE CLAIM**

The world has passed the point of peak oil, meaning that we are now on the downslope. We as human beings are affected by oil in almost every aspect of our day to day lives. Nearly everything we come in contact with on a daily basis has been affected by oil in one way or another. We have taken all of these things for granted and in doing so we may have compromised our future.

## **PREMISES**

We have come to the end of the cheap oil era. Can we replace an economy whose backbone vibrates with the tolerance of cheap oil and careless pollution with one that runs on renewable energy, heals our surrounding ecosystems and creates no waste?

## **PROJECT JUSTIFICATION**

Anything made from petroleum will eventually become very expensive. Living in proximity to other people, driving less, and new or different modes of transportation will become a part of daily life. The spike in population within inner city limits will rise over the next 50 years and the need for accommodating these people sustainably is the focus of this thesis.



# REED STREET YARDS INNER CITY MILWAUKEE

## THESIS PROPOSAL



BRYAN LEININGER  
11.2010

# NARRATIVE

We have come to the point where the kind of city being built is dependant on the future of oil and its affordability. We have come to the end of the cheap oil era and have found true evidence of the effects of carbon emissions on our planet.

We're realizing that the pattern of suburban sprawl, which for the last 40 years has dominated North American cities, has proved to be a very inefficient way of planning. What's more, the suburbs themselves face real challenges (mortgage crisis, empty policies and continued sprawl), and may in their current incarnations be doomed.

The prospects of an alternative fuel are at this point very poor. The implications seem to be very clear. We will need to change the way we inhabit this planet. We will need to rethink, rescale and 'redesign' every aspect of daily living.

Is the world ready for this paradigm shift?

# USER/CLIENT DESCRIPTION

## owner/client

Owners and clients of this site will consist of people from both public and private sectors. With converging pressures from the east (The Historic Third Ward) and the west (private developer), this site be a division where development can act as a buffer between the newly developed condos (adaptive reuse) to the east and the large scale industrial sites to the south and west.

Public land may consist of parks, where habitat rehabilitation and stormwater management and retention can be implemented, and open space where residents of the site can grow, produce, recreate and relax.

Current demographics of adjacent properties mostly consist of young (median age 25) professionals who live and work within proximity of their residence (OnBoard LLC, 96-09). User age groups won't drastically change from the current neighborhood demographics. The goal will be to provide an adequate amount of space to allow for residential/retail mixed use where inhabitants live near their place of work.

# MAJOR PROJECT ELEMENTS

## **Policy Development**

A key framework will be developed for strategic action on effective spatial planning and developmental control. This includes land use, transportation systems, energy and waste planning, and water management.

## **Carbon Conscious Design**

Energy efficient and resource efficient development can include energy producing characteristics. All aspects of this 'design model' will be well connected to downtown Milwaukee and will encourage efficient ways of transportation such as public transportation, bicycle, and pedestrian scale walkability.

## **Compact Urban Design**

An emphasis on compact urban design will embrace high density living, mixed uses and a defined and protected system of open spaces. Open spaces will include biodiverse landscape planning, opportunities for food production, and will become fully integrated into the urban fabric.

## **Landscape Sustainability**

Elements of sustainability will occur in a multitude of different ways. With the development of policies, there will be a minimum requirement for 'greening' of the community.

Examples include:

- Reduction of stormwater runoff
- Reduction in water usage in the landscape
- Biofiltration systems
- Usage of grey water in the landscape
- Enhanced wildlife habitats in the urban environment
- Permeable paving materials
- Locally found/reused/reclaimed materials

A sustainable landscape is designed to be both attractive and in balance with the local climate and environment and it should require minimal resource inputs. Thus, the design must be functional, cost-efficient, visually pleasing, environmentally friendly and maintainable.

# SITE INFORMATION

Wisconsin is located in the upper Midwest of the United States. It is bordered by four states; Minnesota, Iowa, Illinois and Michigan, and two Great Lakes, Lake Michigan and Lake Superior. The capital of Wisconsin is Madison and its largest city is Milwaukee. Tourism is one of Wisconsin's biggest industries, with huge numbers of visitors drawn to the metropolitan cities, beautiful state parks and small towns that appeal directly to tourists, such as Wisconsin Dells. On the eastern side of the state, Door County sits on the peninsula that reaches into Lake Michigan and it is one of the top summer destinations in Wisconsin. The state has been given the nickname of "America's Dairyland." Microbreweries and brewpubs thrive in Milwaukee and throughout the state.

Milwaukee is known for its German, Polish, Mexican, Scandinavian and Irish heritage, its long history of brewing and manufacturing and identity as the heart of Wisconsin's unique culture. Founded from three smaller Milwaukee River townships in 1846, Milwaukee has grown into its moniker, Gateway to the North.

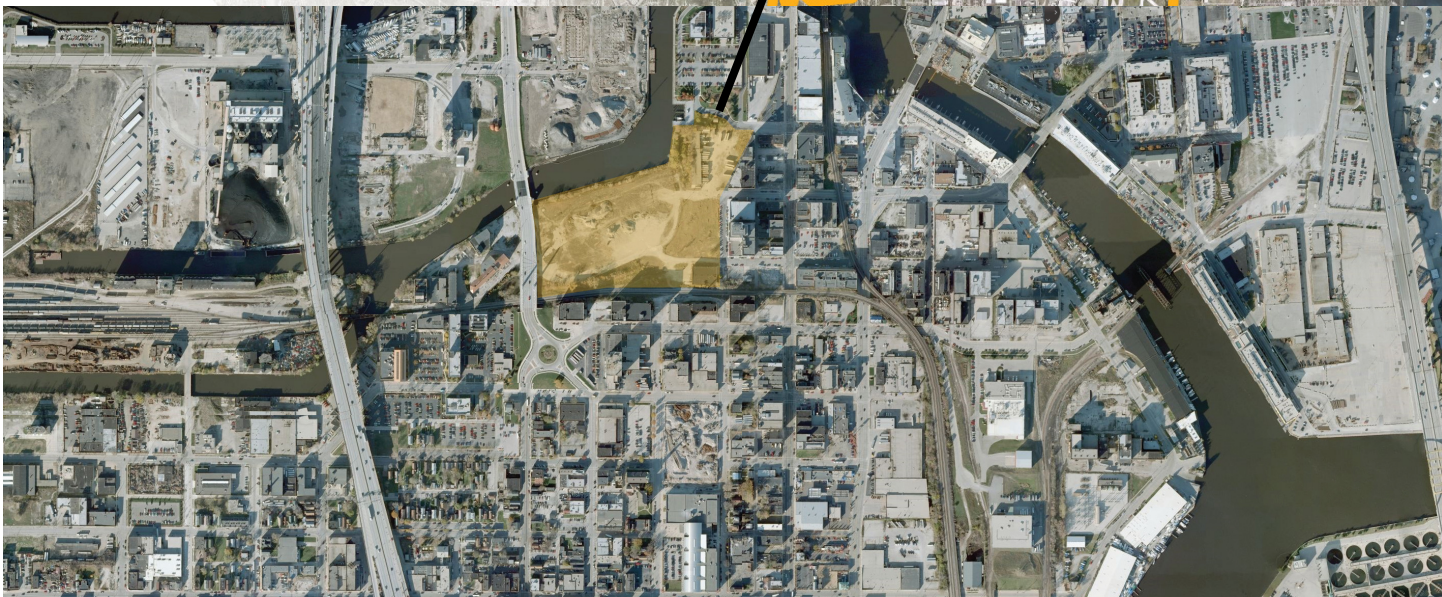
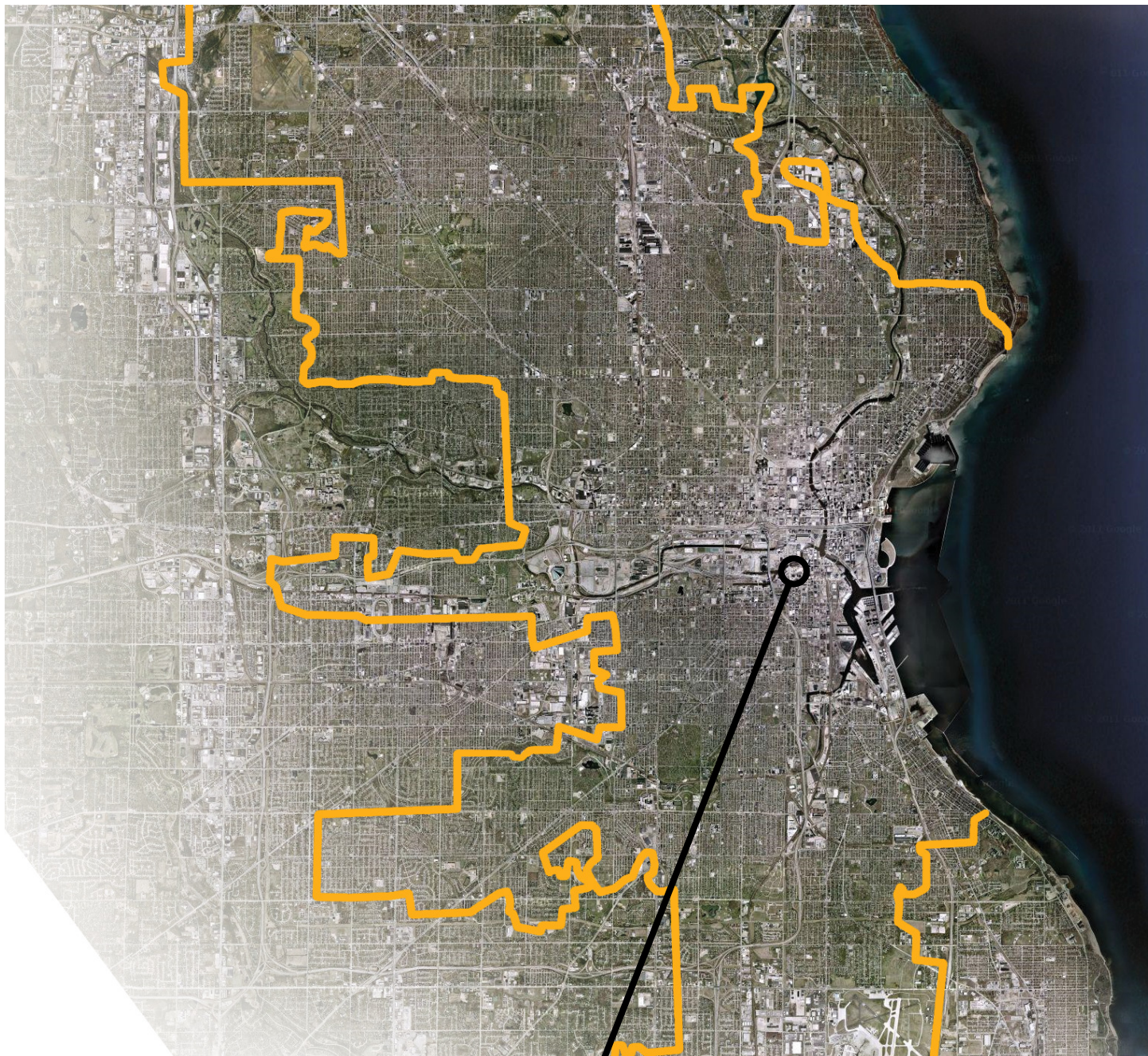
Total Population	5,363,675
Male	49.4%
Female	50.6%
18 years and over	74.5%
65 years and over	13.1%
Married Persons	56.2%
Single Persons	43.8%
Median Age	36.0
Average Family Size	3.05
Ethnicity	
White	90.0%
Black or African American	6.1%
American Indian and Alaska Native	1.3%
Asian	1.9%
Native Hawaiian and Other Pacific Islander	0.1%

<http://www.wisconsin.com/demographics.html>

# SITE CONTEXT









# PROJECT EMPHASIS

An emphasis will be on new and forward ideas of sustainable and low carbon development throughout the research of the theoretical premise. Research will vary on multiple aspects throughout the development of this thesis but a focus will be toward low carbon urban development.

# PLAN FOR PROCEEDING

As the inventory and analysis process begins research priorities will consist of:

1. The Theoretical Premise/Unifying Idea
2. Project Typology
3. Historical Context
4. Site Analysis
5. Programmatic Requirements

Design methodologies will include multiple modes of analysis. Much will be highlighted under mixed use development in a carbon neutral style of development. Digital and graphic analyses will occur.

In the coming months, interviews will be conducted with local city officials as well as past and present residents of the City of Milwaukee.

Qualitative, quantitative and statistical data will be compiled within a document similar to this and will be presented in a digital format through North Dakota State University's Architecture and Landscape Architecture Library Digital Commons.

# PREVIOUS STUDIO EXPERIENCE

LA 571: Fall Semester 2010  
Advanced Landscape Architecture III:  
Environmental Planning  
Instructor: Catherine Wiley  
Sheyenne National Grasslands/ Bison  
Reintroduction- McLeod, ND

LA 472: Summer Semester 2010  
Vertical Studio  
Instructor: Ronald Ramsay  
North Coast College Campus Master Plan Design -  
Duluth, MN

LA 472: Spring Semester 2010  
Advanced Landscape Architecture II:  
Phytoremediation  
Instructor: Stevie Famulari  
Acid Canyon- Los Alamos, NM  
Hesco Basket Flood Mitigation Design Competition-  
Fargo, ND

LA 471: Fall Semester 2009  
Advanced Landscape Architecture I: Urban Design  
Instructor: Mark Lindquist  
Triangle Park – Portland, OR  
McCormick and Baxter Waterfront- Portland, OR

LA 372: Spring Semester 2009  
Landscape Architecture IV: Community Design  
Instructor: Kathleen Pepple  
South Fargo Residence – Fargo, ND  
Lion's Club Park- Battle Lake, MN

LA 371: Fall Semester 2008  
Landscape Architecture III: Site Topography  
Instructor: Stevie Famulari  
Fargo Dike & Island Park – Fargo, ND  
Symphonic Alley- Fargo, ND

LA 272: Spring Semester 2008  
Landscape Architecture II: Regional Park Design  
Instructor: Mark Lindquist  
Pioneer Park – Valley City, ND  
Point Douglas Neighborhood- Winnipeg, Manitoba  
Ready-Mix Concrete Design Competition

LA 271: Fall Semester 2007  
Landscape Architecture I: Residential Design  
Instructor: Kathleen Pepple  
Kennedy Court Vacant Lot – Fargo, ND  
Klai Hall Landscape- Fargo, ND

# REED STREET YARDS INNER CITY MILWAUKEE

## THESIS PROGRAMMING



BRYAN LEININGER  
11.2010



# PROGRAM DOCUMENT

RESEARCH RESULTS AND GOALS  
CASE STUDIES  
HISTORICAL CONTEXT  
SITE INVENTORY  
SITE ANALYSIS  
PROGRAMMATIC REQUIREMENTS  
REFERENCE LIST





# RESEARCH RESULTS AND GOALS

INVESTIGATION INTO THE THEORETICAL PREMISE AND  
PROJECT TYPOLOGIES

HISTORICAL, SOCIAL, AND PHYSICAL CONTEXT

# RESEARCH RESULTS AND GOALS

## INVESTIGATION INTO THE THEORETICAL PREMISE

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Research to support the theoretical premise forced forward thinking and an in-depth analysis of documents published by international councils of planners, architects, and landscape architects such as The International Society of City and Regional Planners (ISOCARP). These publications provided ideas and brainstorming exercises which began to look at future city planning along with growing world environmental issues.

These international congresses influenced, provided inspiration and allowed for a tighter focus for continued research needed for a comprehensive investigation into the theoretical premise.

# RESEARCH RESULTS AND GOALS

## INVESTIGATION INTO THE PROJECT TYPOLOGIES

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To be fully competent of the selected project typologies, research was conducted on the major thesis project elements which consisted of: policy development, carbon conscious design, compact urban design, landscape urbanism and landscape sustainability. Community and neighborhood analysis would unveil opportunities for needed amenities within the site or within walkable distance from the site.

Through this research, connections and comparisons were researched between major project elements and the economic and sociologic concepts which lie behind large scale site design.

# RESEARCH RESULTS AND GOALS

## INVESTIGATION INTO THE PROJECT TYPOLOGIES

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### policy development

Conventional coding generally ignores building and landscape form. It focuses on site use, which can result in generic buildings that are out of character and do not benefit overall site design and sense of place. Form-based codes focus on building form and how it affects public space. By relating buildings to the street and open spaces rather than to parking lots or private yards, public spaces are redefined from the conventional automobile-oriented scale to the human and pedestrian-oriented scale.

At the very minimum, each code will detail building, façade and use requirements, and height. The regulations frequently include acceptable minimum and maximum heights and a build to zone rather than a setback (Anderson, 2008).

The implementation of form-based codes allows for more focus on creating an active, sustainable neighborhood that reconnects to existing buildings, streets, pedestrian corridors and open spaces.

# RESEARCH RESULTS AND GOALS

## INVESTIGATION INTO THE PROJECT TYPOLOGIES

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### carbon conscious design

There are more than 45 million structures in the United States, the majority of which will still be in use by mid century. During that same period, the amount of building stock is expected to increase by as much as 46 percent (Adelaar, 2008). Given these increases, it is imperative that building design follows a strict regiment which forces green zero energy or zero carbon building construction.

A zero energy building is designed to be optimally energy efficient and to satisfy remaining energy demands to the greatest extent with on-site renewable sources, such as solar, wind, and passive energy production. Zero carbon buildings are structures that 'purchase' renewably sourced power from the grid.

In an effort to achieve true sustainability, all new structures on site will follow a strict materiality palette.

Materials used may not significantly deplete a world resource or cause disruption in global or local environments. They also will not present serious hazards in either production, use in the construction, or the way they are utilized post construction.

Along with carbon conscious building design, site design will also be considered. Street design will be sufficiently connective to encourage less travel by car. Walking and bicycling will become the main form of transportation within the neighborhood, while transit becomes the main form of travel to areas outside of the neighborhood.



# RESEARCH RESULTS AND GOALS

## INVESTIGATION INTO THE PROJECT TYPOLOGIES

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### compact urban design

Through research, it is evident that an actual definition of compact city design is very vague. Many publications and individuals have portrayed their ideas in different ways, which provide strengths and weaknesses in designing compact urban developments. The best definition that provides a framework for this thesis was written by Burton E. (2000): [a compact city] in general is taken to mean a relatively high-density, mixed-use city, based on an efficient public transportation system and dimensions that encourage walking and cycling. Compact urban design has often been designed primarily to reduce the use of automobiles and minimize the loss of countryside.

Higher density settlements are more socially sustainable because local facilities and services can be maintained due to high population densities, and therefore accessibility to goods and services is more equitably distributed' (Williams, 1999)

Although the thesis site is not located within the downtown core, it is located in an area with high development pressure which has a great deal of potential to provide a high quality mixed-use development. This development could be crucial for crumbling industrial sites to the west and can also improve the quality of the developing Third Ward to the east. In this particular thesis, the idea is to improve the vitality and vibrancy of urban life which in turn will encourage cultural activities and social interaction. Theoretically it will rejuvenate the local economies that have been neglected by urban decentralization and sprawl.



# RESEARCH RESULTS AND GOALS

## INVESTIGATION INTO THE PROJECT TYPOLOGIES

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### landscape sustainability

Sustainable site design will address water quality, quantity and floodplain issues, native species, open space that provides recreation, wildlife habitat, cultural and neighborhood connections and alternative transportation, lighting and parking design.

# RESEARCH RESULTS AND GOALS

## INVESTIGATION INTO THE PROJECT TYPOLOGIES

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### landscape sustainability **stormwater management**

On a landscape that has been historically scarred, an effort to create a site which is completely sustainable is the foremost goal in this thesis design. The Menomonee Valley is currently peppered with blight and abandoned, contaminated and ecologically disrupted landscapes where sustainability in recent years has become of utmost importance for the City of Milwaukee.

The river ran its natural course until the mid 1800s, when its marshes were filled to make way for industrial development (Menomonee Valley Partners, 2010). Stormwater preservation and management will be conducted through the utilization of cost effective natural systems that will use water efficiently and enhance water quality. The stormwater management mitigation systems used will follow these guidelines:

- A. Stormwater conveyance systems will use a connected series of vegetated swales or channels for stormwater filtration.
- B. Stormwater systems will avoid a direct discharge into the Menomonee River.
- C. Landscape materials, soils and subsoils will be designed for infiltration and capturing of stormwater.
- D. Native drought tolerant plantings will be used in order to eliminate the use of excessive irrigation - other than collected rainwater.
- E. Green roof systems will be used to collect and evapotranspire rainwater, which reduces runoff as well as heating and cooling loads of the structure.

# RESEARCH RESULTS AND GOALS

## INVESTIGATION INTO THE PROJECT TYPOLOGIES

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### landscape sustainability **natural landscape**

Habitat loss and fragmentation are by far the most significant threats to the conservation of native plants and wildlife. Habitat loss is among the leading causes of imperilment for 85% of the endangered and threatened species listed under the U.S. Endangered Species Act (Kihlslinger, Wilkinson McElfish, 2008). Land use decisions at the local level play a large role in conservation and biodiversity. A site of 15.5 acres may only be able to provide so much natural landscape, but to ensure biodiversity and habitat restoration it will include:

A. Large, high quality, well connected habitat patches which can support populations of native and rare species.

B. Wide vegetated buffers to minimize adverse effects on habitats and ensure water quality and stream habitat.

The landscape designed on this site will use native plant species which can reduce water consumption and long-term maintenance costs. It will also ultimately improve building efficiency and aesthetics.



thesis program

# RESEARCH RESULTS AND GOALS

## CASE STUDY RESEARCH

### case study #1 **Christie Walk - Adelaide, Australia**

Christie Walk is an activist-driven sustainable development located in the heart of Adelaide. The total development size is a little over a half acre and houses 27 dwelling units. Adelaide, the sprawling state capital, has more than 1 million inhabitants and has started to brainstorm and design infill property to save the outskirts of the city from continued sprawl. Christie Walk was the first of its kind in South Australia, which ultimately tackles difficult sustainability issues with cutting edge techniques.

The development is home to South Australia's first intensive green roof system, as well as a community garden space. The development has only made space for 11 parking spots for the 27 units. It has 7,535 square feet of productive landscape as well as 1,800 square feet of productive roof garden space. Christie Walk retains all water that falls on site. Along with these highlights, it has also integrated important sustainable planning ideas such as food production, open space, stormwater infiltration systems, wastewater treatment, mid-high residential density, care sharing and public darkness codes.

Allhomesfacepedestrian paths that are lined with greenery. The paths lead to key community center points, such as a central market, bus routes, light rail stops, and open parklands.



# RESEARCH RESULTS AND GOALS

## CASE STUDY RESEARCH

### case study #1 **Christie Walk - Adelaide, Australia**

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The idea was to design Christie Walk as a small-scale template for what could eventually happen throughout the rest of Australia and around the globe. The project also insists that sustainable design can be used for affordable housing. Sustainable developments are often thought of as hippie communes that may cost more to create the sustainable lifestyle. In this situation, a small scale, mid-density development has been placed within an area of Adelaide that was formerly home to derelict housing and light industry with a diverse low income population surrounding the development. With its drastically lower energy costs, the housing has become extremely affordable through low costs of living. This development engages the existing community through large access points and corridors.

Throughout the entire build process, the community was engaged. In the early stage of the design process, a builder couldn't be found who would be

willing or able to work with environmental concepts and materials. The community developed their own building company with the help of small local contractors. They trained themselves in order to fill the void with on-site educational facilities that allowed residents to spread knowledge and inform the community about sustainability and healthy living.

(Ecopolis Architects, 2006)





# RESEARCH RESULTS AND GOALS

## CASE STUDY RESEARCH

### case study #2 **Kronsberg District - Hannover, Germany**

The Kronsberg District is the city of Hannover's model for sustainable development. The city had the foresight to begin purchasing land in the late 1970s to use for future sustainability guidelines and development. The decades-long planning process resulted in a development scheme dominated by ambitious energy reduction goals, transit-oriented design, and mixed-income residential development.

The large 550-acre site allowed the city to create a plan with a clearly defined residential and mixed use sustainable development which also allows for designated protected open park space. At 47 dwelling units per acre, the density is able to support

a new light rail system which has three stops in Kronsberg. The density supports K-12 schools within the development. Each stop is situated so that residents won't have to walk more than 1/3 of a mile. The main arterial road is also situated along the main train line which effectively eliminates through-traffic in the neighborhoods.

Kronsberg prides itself in its application of green technology in building construction, landscape design, and in the development of high-performance infrastructure.





# RESEARCH RESULTS AND GOALS

## CASE STUDY RESEARCH

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### case study #2 **Kronsberg District - Hannover, Germany**

The policies and guidelines that were designed and developed are called the Kronsberg Standard. The city was able to acquire multiple land development contracts with developers who ensured that every aspect of the development would meet these very strict green construction guidelines.

The development offers a much needed socially diverse housing mix. All housing except a small portion of terrace housing is social housing, which shapes the demographics for the development (City of Hannover Urban Planning, 2003).



# RESEARCH RESULTS AND GOALS

## CASE STUDY RESEARCH

### case study #3 **Dockside Green - Victoria, British Columbia**

The 15 acre reclaimed industrial wasteland is home to British Columbia's most ambitious green venture. The city and developers created a zero-carbon development with a LEED platinum certification for the entire development.

There are four distinct building characters which are each centrally located around green infrastructure, such as pedestrian corridors, wetland and wildlife management corridors and efficient mixed-use hubs which are home to office space, non-chain restaurants and retailers.

All 26 buildings on site have been LEED platinum certified with a bold pledge by Joe Van Belleghem of the Windmill Development Group, who said that he would agree to a \$1 million penalty if the entire development didn't pass LEED platinum standards.

There are a variety of different new technologies that are used in this small high density development. Many which are designed to reduce electricity use and waste management. All lighting consists of low voltage LED lighting, which is also connected to occupancy sensors, and outdoor lighting that is completely supplied by solar power.

Residential diversity is ensured with approximately 10% of the development dedicated to affordable housing and senior assisted living.



# RESEARCH RESULTS AND GOALS

## CASE STUDY RESEARCH

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### case study summary

The case studies selected for research all have common goals and typologies which can be aligned with goals that are laid out in this design thesis.

# RESEARCH RESULTS AND GOALS

## HISTORICAL CONTEXT

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### a historical timeline of **urbanization**

One of the distinguishing features of Milwaukee is the Menomonee River Valley. It is four miles long and approximately a half-mile wide, formed some 10,000 years ago by glacial meltwater. It was an expansive growing medium for wild rice, cattails, rushes and reeds.

Wild rice was a very important source of food for local Native American tribes. The wetland plants provided the raw materials for important trade goods such as baskets, mats and shelters. Wildlife and marine animals were very abundant and were documented by James Buck, a pioneer historian. In his exploration journal dating back to the 1830s, he noted, "All the marsh proper ... would, in the Spring, be literally alive with fish that came in from the lake.... And the number of ducks that covered the marsh was beyond all computation. Thousands of young ones could be seen in the breeding season, apparently not a week old, swimming around as happy as need be ...." (Gurda, date unknown).

Because of the immense amount of available resources, the Valley was an obvious choice for settlement. Five known native tribes called adjacent areas home: Potawatomi, Ojibwe, Odawa, Sauk, and Fox tribes who settled the Milwaukee area post-1600. The area became a hub for French Canadian fur traders who would arrive in the 1600s.

By the early 1800s, overhunting, smallpox, and alcohol began to take a toll on the fur bearing animals and the hunters who would have made their living harvesting the animals. Very few traders remained at their posts, but those who stayed began trading other forms of commodity, such as land.

# RESEARCH RESULTS AND GOALS

## HISTORICAL CONTEXT

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### a historical timeline of **urbanization**

The early settlements of the Valley came into existence through the hands of large land owners of the time. Byron Kilbourne, was the first to construct a bridge across the Menomonee Valley.

The Valley was historically very difficult to traverse. Many who would sail the stream would find themselves turned around and end up in a shipyard, or near one of the many riverfront breweries of the time (Milwaukee Sentinel, 1861). The years of the Valley soon came to an end. In an effort to efficiently move Wisconsin's high yielding cropland to other parts of the region, a railroad line was laid in 1849. With many months of unsuccessfully laying tracks in the marshland of the Valley, it was finally filled with solid ground in late 1850. In 1857 the first pioneer track reached the great Mississippi River. By 1862 the city became the most successful shipper of wheat in the world. Large grain elevators began to rise along the Menomonee.

Much of this product was not shipped out of Milwaukee. It was processed into flour, hops and barley for beer. Hogs and cattle were used for meat and leather products. German immigrants Guido Pfister and Frederick Vogel opened a tannery

(approximately 15 acres of the thesis site), which became America's flagship tanning facility. Among the booming industries was an expansive Pabst brewery, Burnham Family Brickyard, and Meadow Springs Distillery.



Interior of the Pfister and Vogel Tannery while a man works diligently on a leather sewing machine. Photographed early 1900s. <sup>1</sup>



# RESEARCH RESULTS AND GOALS

## HISTORICAL CONTEXT

### a historical timeline of **urbanization**

With the local economy booming, it became essential to provide a system of canals, slips and docks to improve the harbor town. What is known as the biggest and most challenging infrastructure improvement project of the nineteenth century made what the Valley is today. Immigrant laborers by the hundreds began to fill the Valley floor by the shovel load. As adjacent bluffs were carved down, the marshland disappeared.

The floor of the Valley was opened up to all citizens of the city to dump freely. It became the offload spot for area industries. As rotting fruits, vegetables, animal entrails, and all sorts of area garbage piled up, the Valley was filled. The great Valley fill created nearly 1400 acres of newly buildable land (Milwaukee Sentinel, 1871).

The area known as one of the most profitable harbors in the midwest soon turned into the "Machine Shop of the World." A variety of machine shops opened their doors, creating some of the oldest known industries in the agriculture (International Harvester), engine manufacturing (Harley Davidson), and railroad manufacturing companies (Chicago, Milwaukee, St. Paul & Pacific Railroad, eventually Canadian Pacific) of today.



Arthur Davidson, Walter Davidson, William Harley, William Davidson, photographed outside the Harley Davidson manufacturing plant. ~1910 <sup>2</sup>

# RESEARCH RESULTS AND GOALS

## HISTORICAL CONTEXT

a historical timeline of **urbanization** and **abandonment**

With a pestering waste problem beginning to arise on the Valley floor, the city installed a garbage crematory. The attempt proved to be unsuccessful as the garbage began to pile up in the river's tributaries.

Pollution from physical waste wasn't Milwaukee's only environmental issue. Air pollution was a problem that lasted until the middle of the 20th century. Coal was the fuel Milwaukee thrived upon. Factories and foundries which built the city poured out clouds of black coal smoke into the atmosphere daily. Pollution was common across all of America's Rust Belt. These pestering problems didn't hurt Milwaukee's economy until the years following World War II. Rail and shipyards became obsolete, giving way to the more technologically advanced motorways. The firms and companies that Milwaukee was built on had left and the city soon became home to barren wasteland. Very few companies were able to make this land economically viable until the 1970s. Mayor Henry Maier cleared blight and ironically had a development plan to create jobs in the Valley where once was the Midwest's economic powerhouse. In 1978, the mayor wrote: This area holds out the strongest hope for this city's continued economic stability. It is the engine that

drives our economy and that engine is rapidly gaining in strength and sustaining power. The Menomonee Valley redevelopment project is probably the largest industrial revitalization project in the country and I am determined that it will also be the best. ((Milwaukee Sentinel, 1979)



Much of the Valley was doomed for demolition. Only photographs and memories are what is left of the past.<sup>3</sup>

# RESEARCH RESULTS AND GOALS

## HISTORICAL CONTEXT

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a historical timeline of **urbanization** and **resilience**

The mayor had been long-winded and overly hopeful in his remarks. The best thing to come to the Valley had been the nation's largest recycling plant in 1980. Even with that, the Valley's fruitful and prosperous past sat blighted and derelict.

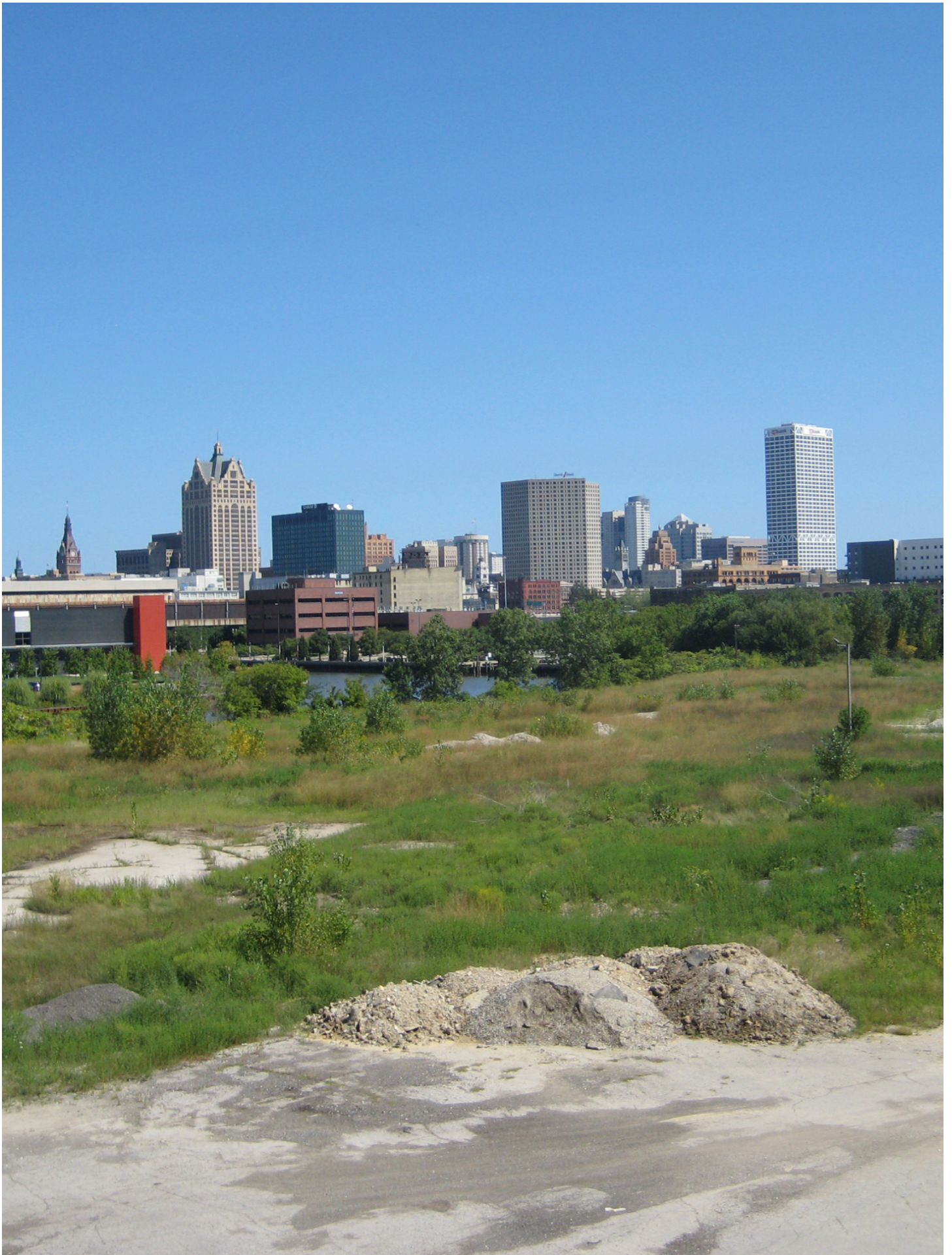
New initiatives both of public and private enterprises began to take interest in this historic piece of land. The mayor who took office in 1988 had a plan to reinvigorate and liven the abandoned land that had sat for nearly a quarter of a century.

As development interest rose, the Menomonee Valley Partners was founded. Members who joined came from all backgrounds. Business owners, public officials, neighborhood advocacy groups, landscape architects, and educators gathered to revitalize the Valley. In its present state, the Valley's downturn is again booming. Abandoned warehouses, factories, and brewery buildings are being purchased by private development companies and have created what is the Historic Third Ward, where the 20 and 30 somethings make a living with their unique stores and shops. (Gurda , J.)

**The Valley is testament to environmental resiliency, where plant and animal habitat had been completely wiped out. Deer have returned to the banks of the river. Ducks, geese and herons have begun to wade the long vacant waterways and riparian plant species have taken root in the neglected soil.**

**The Valley sits and waits quietly, hoping to relive its fruitful and vibrant past.**





# RESEARCH RESULTS AND GOALS

## THESIS PROJECT GOALS

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academic, professional, and personal

“ Success is not final, failure is not fatal: it is the courage to continue that counts. ”  
- Winston Churchill

## THESIS PROJECT GOALS

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academic, professional and personal

To test true limits of landscape architecture knowledge, demonstrating that the work produced is a compilation of my career as a landscape architecture student at North Dakota State University.

To travel a grueling thought provoking process that brings forth qualities and character that shape me as a designer and become evident in future design work.

To design a truely unique project that will far exceed and set itself apart from past work of my own.

To motivate and inspire future readers of this document and aspiring landscape architects who are enrolled at North Dakota State University.

To create an ethical solution to a design problem which is being faced in cities across the United States.

**To create memories that shape my future as a designer, ambassador and steward of the land.**

# RESEARCH RESULTS AND GOALS

## SITE ANALYSIS

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### spatial analysis - southern downtown milwaukee

Much of southern Milwaukee was built on its largely productive industrial past. To the south of the industrial district lies single family and multi-family residential areas. Historically, this area was home to many who were less fortunate and lower income. There was a divide known as the "Mason Dixon" boundary of Milwaukee. Low income housing was always on the south side. To break this diversity barrier, Father James Groppi led the first open housing march to protest segregation and discrimination ("Menomonee valley history," 2010).



# RESEARCH RESULTS AND GOALS

## SITE ANALYSIS

spatial analysis - aerial

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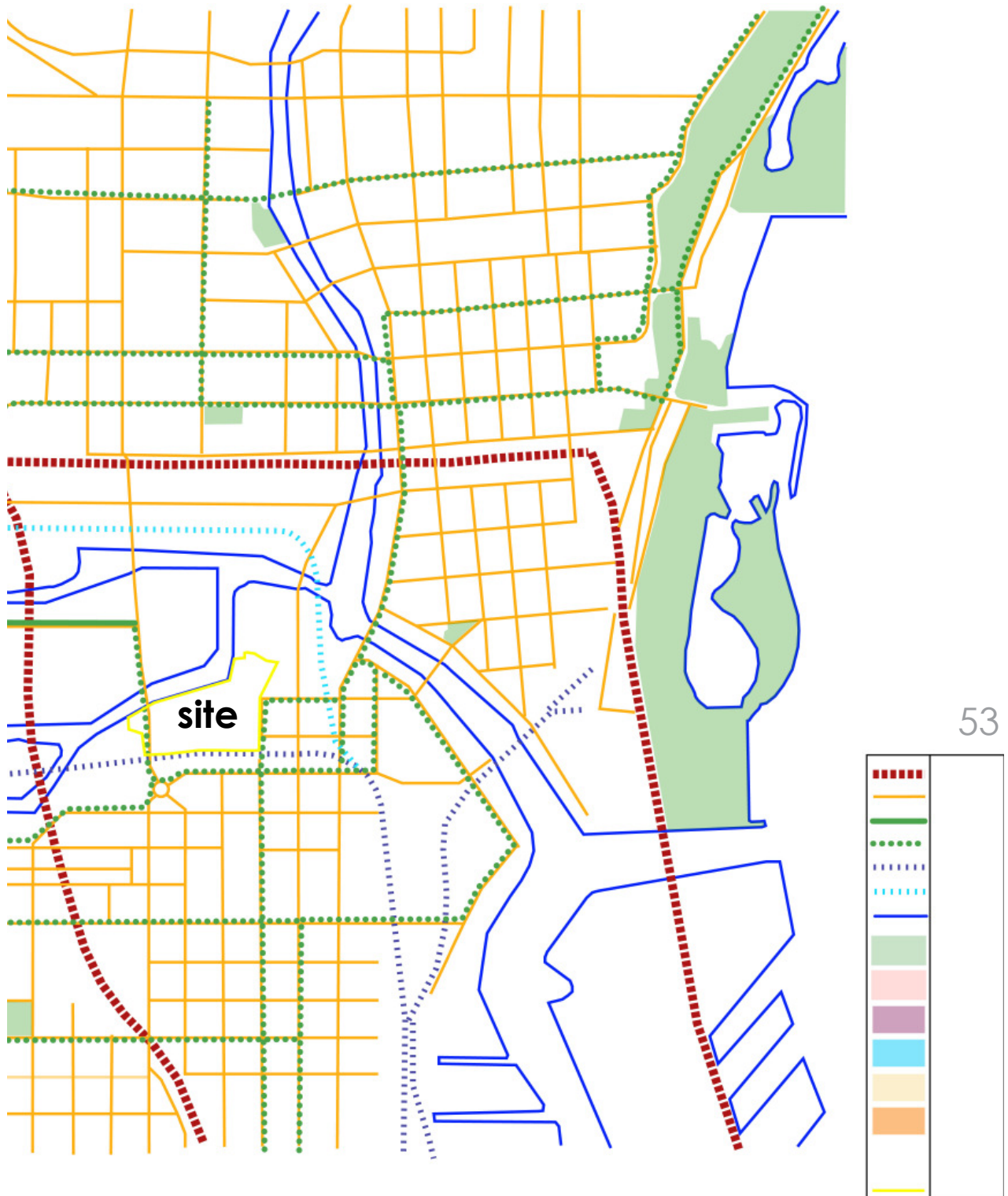




# RESEARCH RESULTS AND GOALS

## SITE ANALYSIS

spatial analysis - green and grey networks



# RESEARCH RESULTS AND GOALS

## SITE ANALYSIS

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spatial analysis - green and grey networks

There are hundreds of miles of dedicated bike lanes in the city of Milwaukee. Unfortunately, the city lacks actual bike trail systems. West of the thesis site begins a portion of the Hank Aaron State Bike Trail, which continues west and northwest through the city for 15 miles.

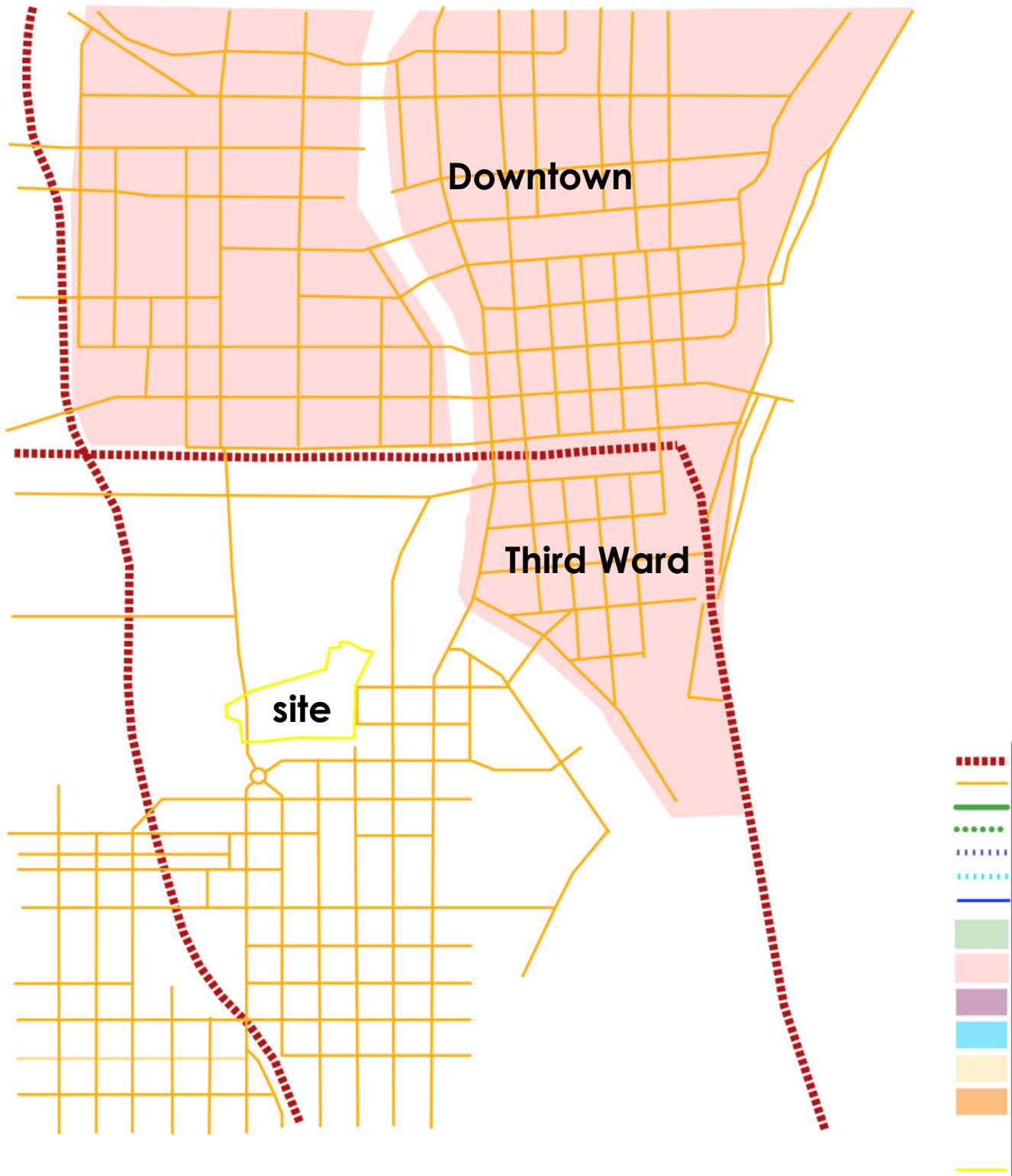
Major thoroughfares close to the thesis site are Interstate 94 and Interstate 43. Major arterials near the site are 6th St. which runs north on the west side.

The location of park systems is shown in light green. As one can see, the waterfront has a very expansive park system not far from the thesis site.

# RESEARCH RESULTS AND GOALS

## SITE ANALYSIS

spatial analysis - grey fabric





# RESEARCH RESULTS AND GOALS

## SITE ANALYSIS

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### spatial analysis - grey fabric

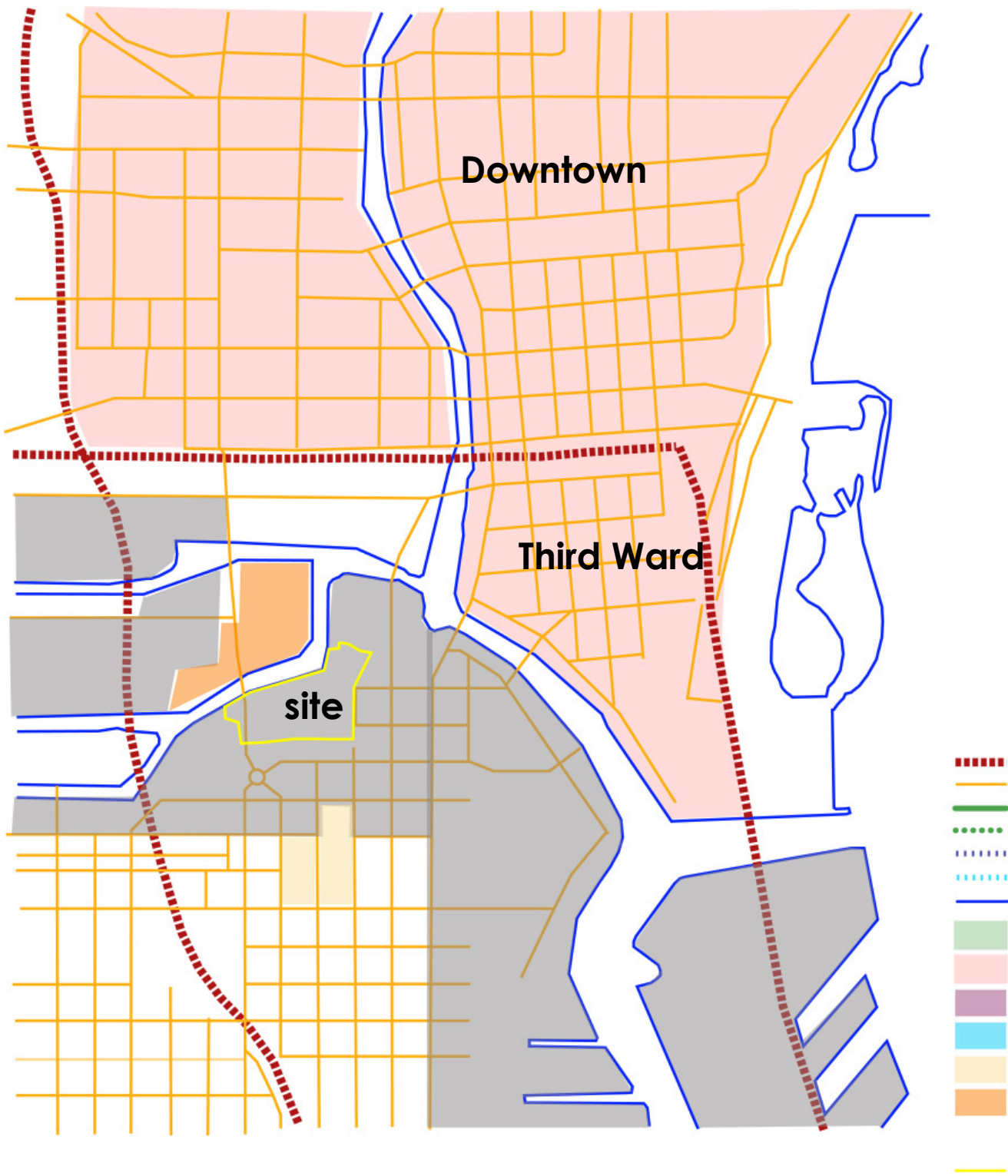
The Historic Third Ward is adjacent to the thesis site. The Ward puts a lot of developmental pressure onto the derelict zoned industrial sites to the west, including the chosen project site. The western edge of the Ward is a 10 minute walk from the border of the thesis site.

Downtown Milwaukee is about a 20 minute walk from the chosen project site. The proximity allows for an easy bike ride to downtown businesses.

# RESEARCH RESULTS AND GOALS

## SITE ANALYSIS

spatial analysis - grey fabric



# RESEARCH RESULTS AND GOALS

## SITE ANALYSIS

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### spatial analysis - grey fabric

Industry is colored in grey, which shows how expansive the industrial zoning is around the site. With developmental pressures from the east, much if this zoning is being reconsidered. Old industrial buildings are being renovated through adaptive reuse programs to reinvigorate this specific portion of Milwaukee.

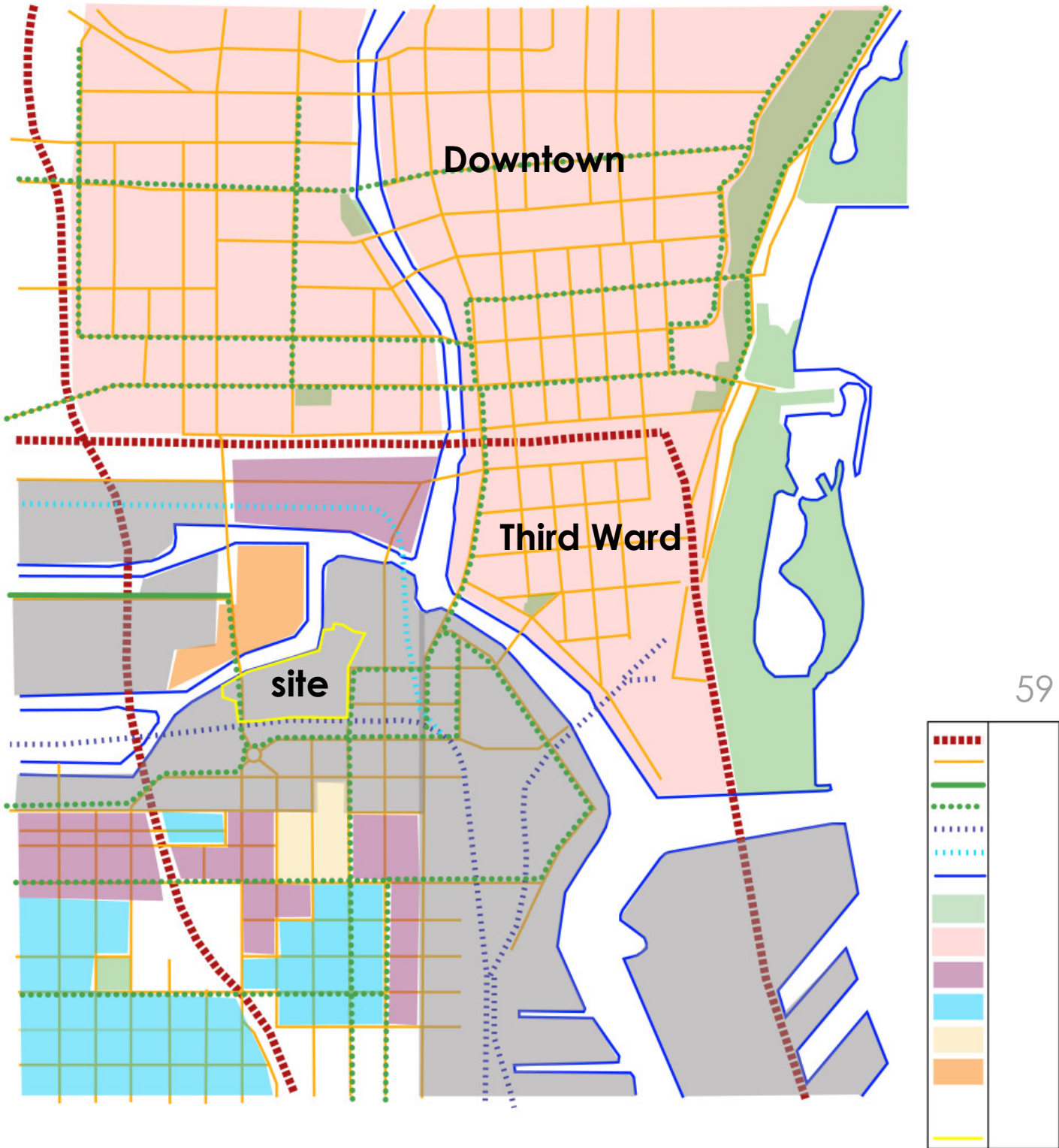
Colored in orange is the beginning of a new development which started with the Harley Davidson Musuem.

In pale tan is institutional development. The one institution adjacent to the site is the Lynde and Harry Bradley Technology and Trade School.

# RESEARCH RESULTS AND GOALS

## SITE ANALYSIS

spatial analysis - grey fabric



# RESEARCH RESULTS AND GOALS

## SITE ANALYSIS

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spatial analysis - grey fabric

Commercial zoning is colored in light pink, which is located to the south my site with residential in light blue surrounding it.

Residential consists mostly of multifamily homes. Single family housing is further south of the southern edge of this map.



# RESEARCH RESULTS AND GOALS

## SITE ANALYSIS

### photographic analysis





# RESEARCH RESULTS AND GOALS

## SITE ANALYSIS

photographical analysis

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# REED STREET YARDS INNER CITY MILWAUKEE

## PRELIMINARY DESIGN AND MASTER PLAN

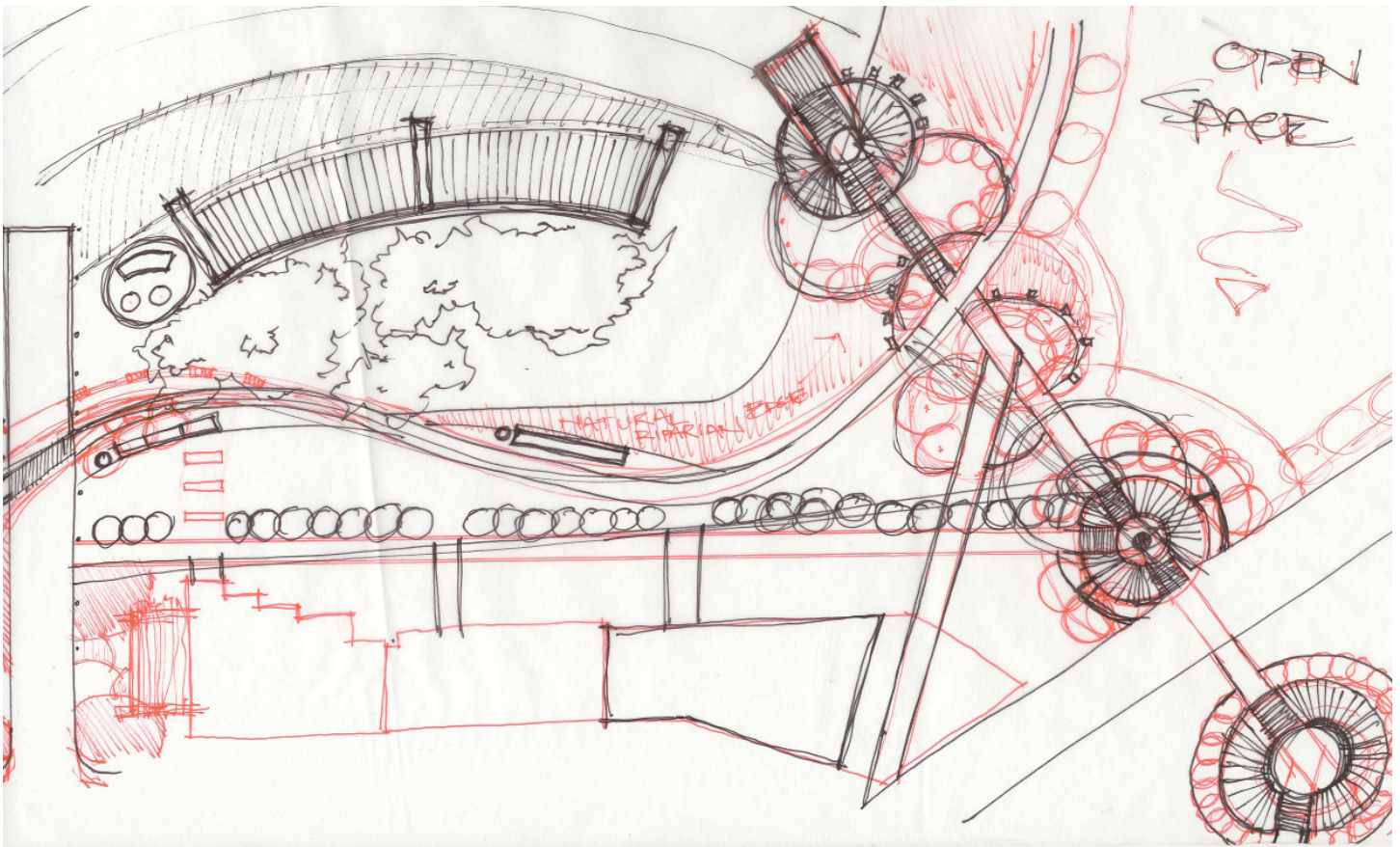
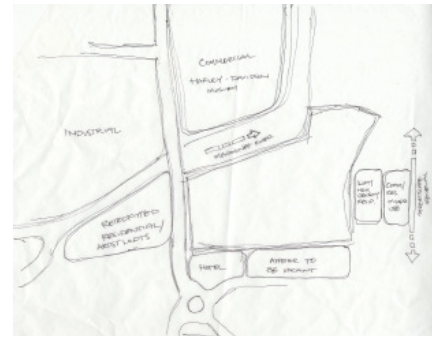


BRYAN LEININGER  
5.2011

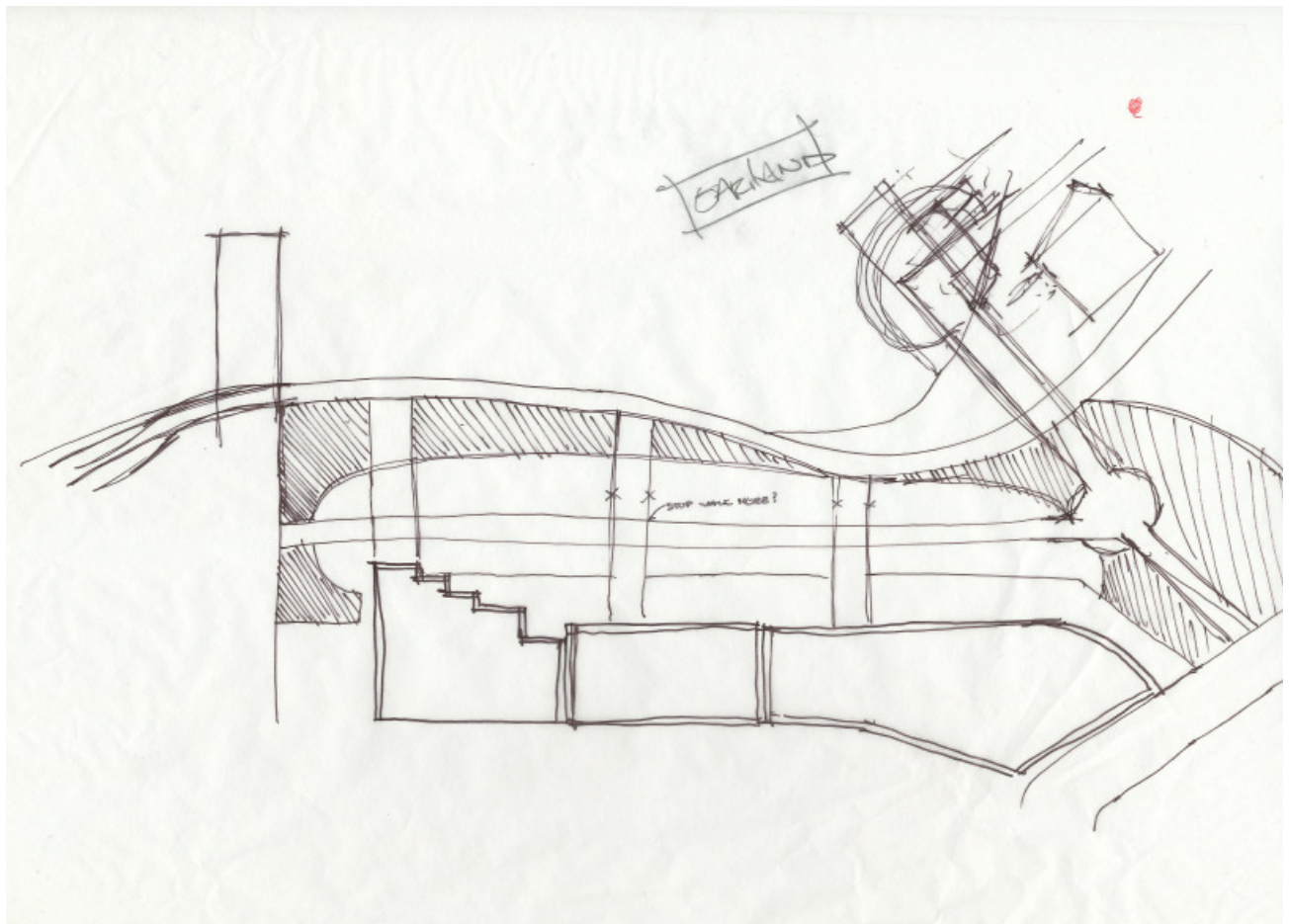


Conceptual design work for this thesis began with an in-depth analysis of existing conditions. Through this process, I was able to find design solutions which were carried through the full design process.

Throughout this conceptual process, I was able to realize the importance of inventory and analysis. Design should have meaning and depth. Without adequate thought, a design can fall flat and if built become unsuccessful.

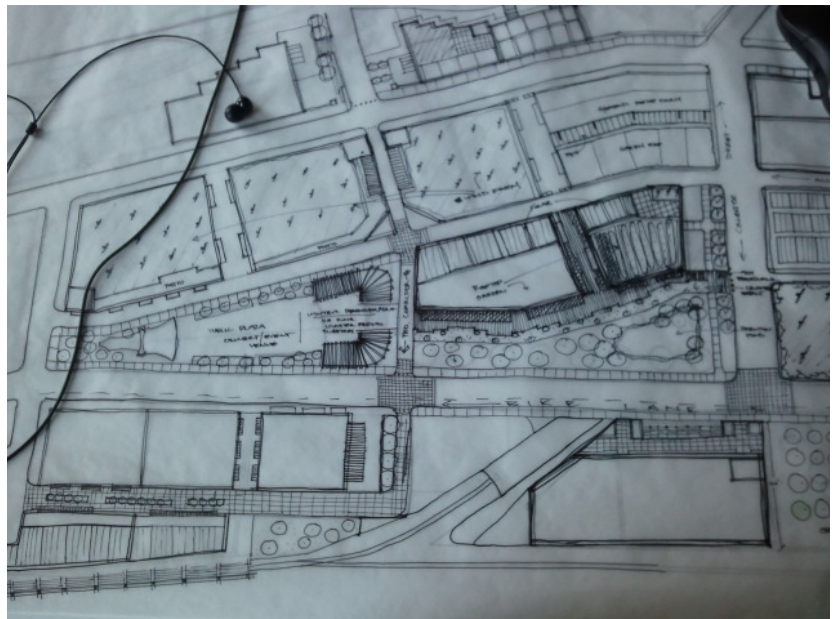
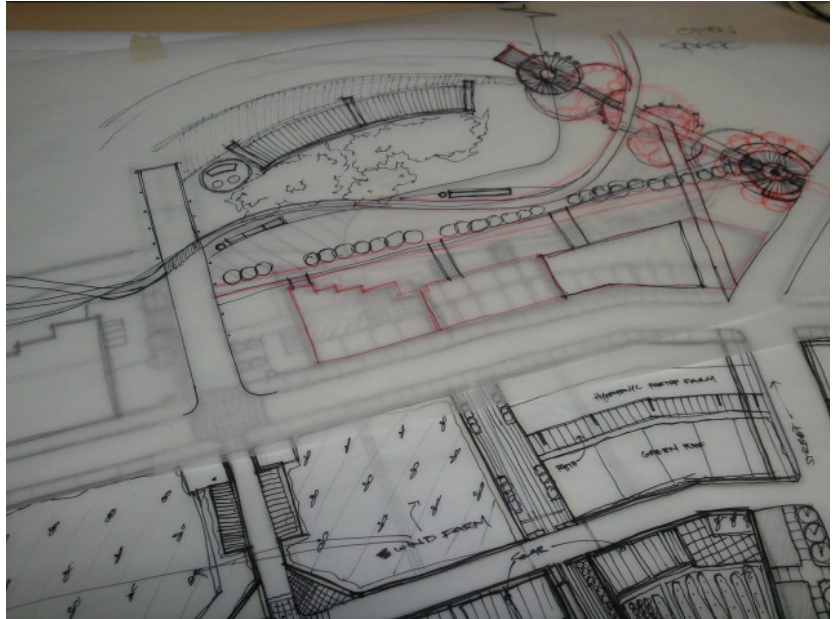


. conceptual design work  
reed street yards, milwaukee





Through the design process, I focused on the cohesion of all major project elements. The most exciting, yet hardest part of the design process is being able to get all of the ideas on to one sheet of paper. After almost nine months of thinking about the site, it became apparent that being able to funnel all of the ideas into one cohesive document would be the most trying part of the entire process.



. conceptual design work  
reed street yards, milwaukee





today,

the Valley is testament to environmental resiliency, where plant and animal habitat had been completely wiped out. Deer have returned to the banks of the river. Ducks, geese and herons have begun to wade the long vacant waterways and riparian plant species have taken root in the neglected soil.

The Valley sits and waits quietly, hoping to relive its fruitful and vibrant past.







We have come to the point where the kind of city being built is dependant on the future of oil and its affordability. We have come to the end of the cheap oil era and have found true evidence of the effects of carbon emissions on our planet.

We're realizing that the pattern of suburban sprawl, which for the last forty years has dominated North American cities, has proved to be a very inefficient way of planning. What's more, those suburbs themselves face real challenges (mortgage crisis, empty policies and continued sprawl), and may in their current incarnations be doomed.

The prospects of an alternative fuel are at this point very poor. The implications seem to be very clear. We will need to change the way we inhabit this planet. We will need to rethink, rescale and 'redesign' every aspect of daily living.

Is the world ready for this paradigm shift?

## Policy Development

A key framework will be developed for strategic action on effective spatial planning and developmental control. This includes land use, transportation systems, energy and waste planning, and water management.

## Carbon Conscious Design

Energy efficient and resource efficient development which can include energy producing characteristics. All aspects of this 'design model' will be well connected to downtown Milwaukee and will encourage efficient ways of transportation such as public transportation, bicycle, and pedestrian scale walkability.

## Compact Urban Design

An emphasis on compact urban design which will embrace high density living, mixed uses and a defined and protected system of open spaces. Open spaces will include biodiverse landscape planning, opportunities for food production and will become fully integrated into the urban fabric.

## Landscape Sustainability

Elements of sustainability will occur in a multitude of different ways. With the development of policies, there will be a minimum requirement for 'greening' of the community.

Examples include:

A sustainable landscape is designed to be both attractive and in balance with the local climate and environment and it should require minimal resource inputs. Thus, the design must be functional, cost-efficient, visually pleasing, environmentally friendly and maintainable.

## Policy Development

A system of Form Based Codes will provide a predictable built environment with a high-quality emphasis on the public realm.

## Carbon Conscious Design

The new plan provides better connectivity to alternative modes of transportation. The best amenity to come to Reed Street Yards is access to light rail.

## Compact Urban Design

The goal density was 55 dwelling units per acre. Through both Smart Growth and a Form Based Code system, the total square footage of dwelling space is 567,954 square feet. This density is necessary for a transit stop within the development.

## Landscape Sustainability

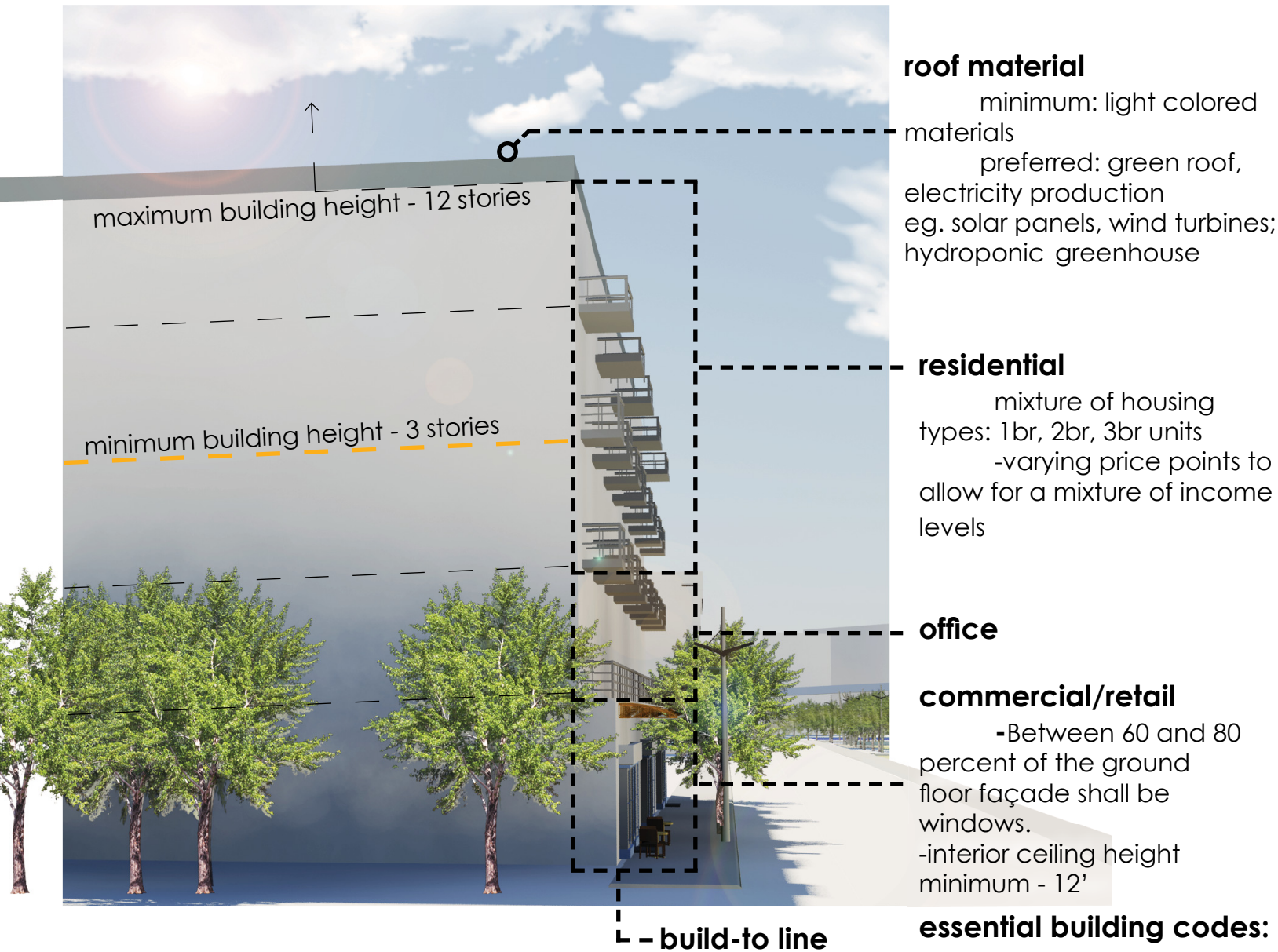
In the new Reed Street Yard Plan, the implementation of a Menomonee River buffer allows for pollutants to be filtered through the landscape before contaminating the River further. Also, street parking is limited, which will cut down on contamination. A majority of the parking will be provided in multi-story parking garages.







## Form-Based Codes



. major project elements  
policy development - private realm

## Form-Based Codes

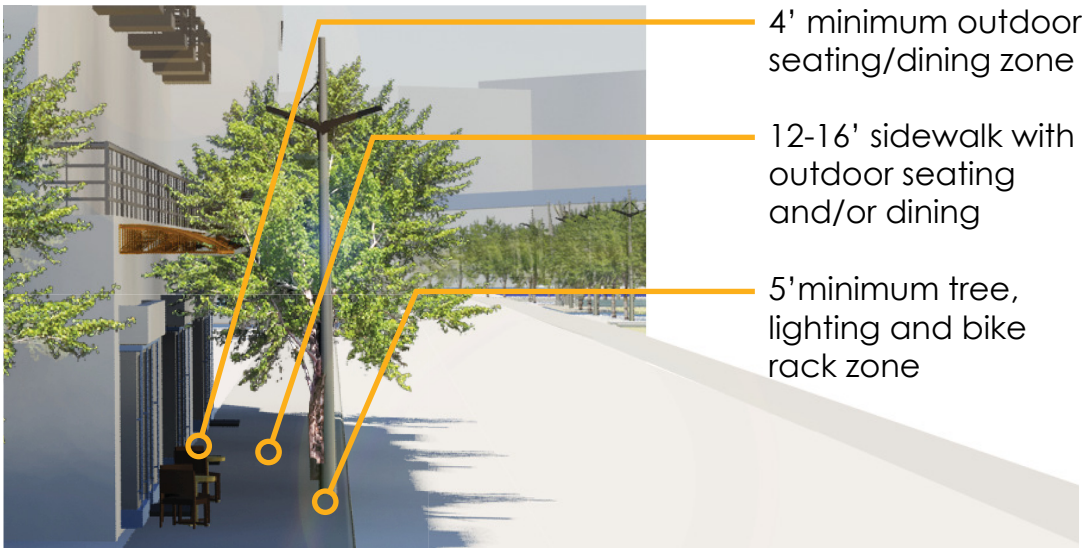
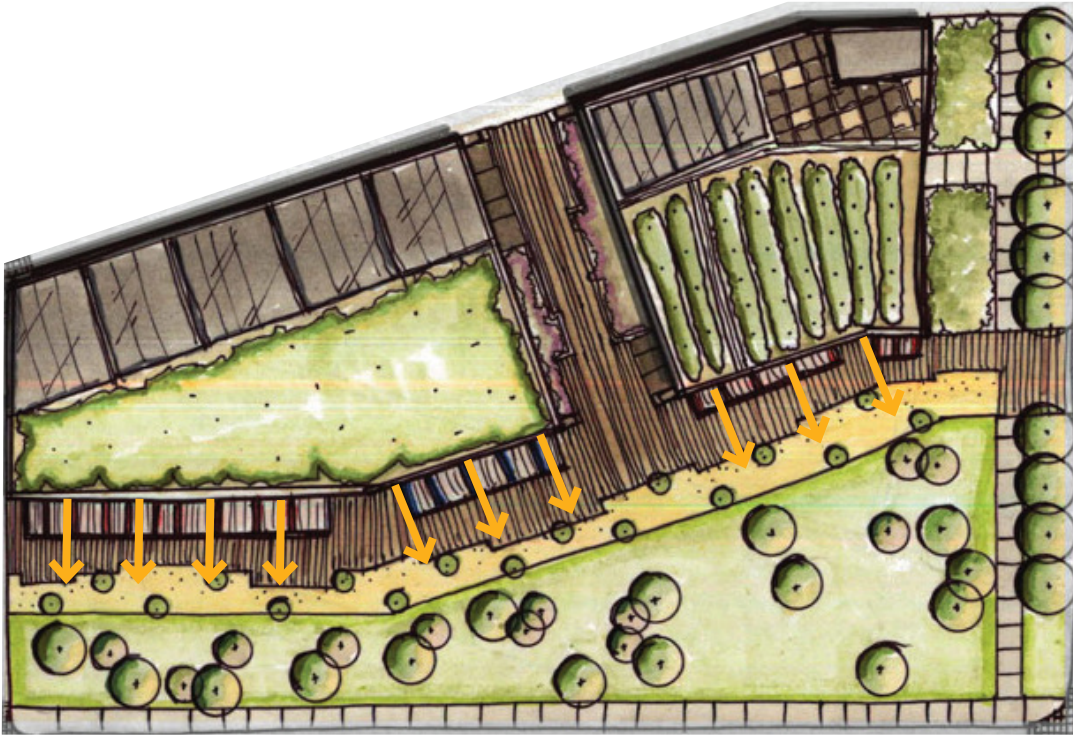
### building orientation

All residential buildings which are adjacent to, or across a street from, a public open space or trail shall face directly on to such amenity

Any retail or office building located adjacent to or across the street from a public open space or trail shall have a major entry and windows overlooking the amenity

### benefits

improves property values and enhances neighborhood security





Designed pedestrian corridors can drastically improve circulation and also create a unique sense of place. These corridors have created a divide between the automobile and pedestrian movement across the site.

The graph below shows how major amenities can be in proximity of one's residence. It is compared to the graphic on the right, which is a typical suburban proximity to major amenities

## Pedestrian Corridors

street and corridor design increase connectivity between amenities

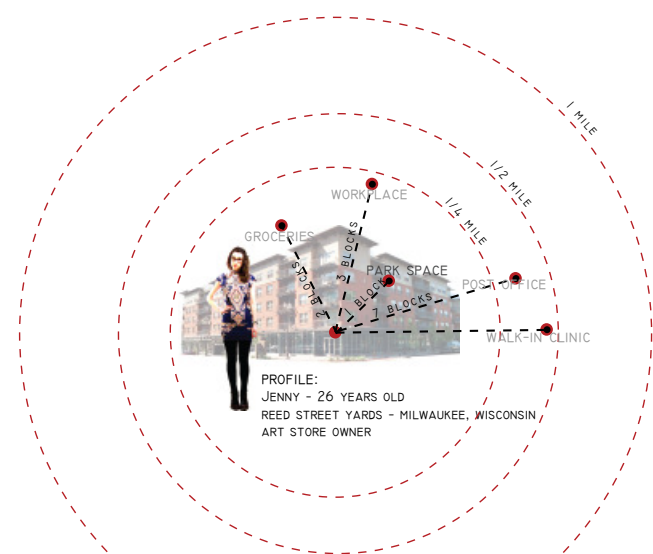
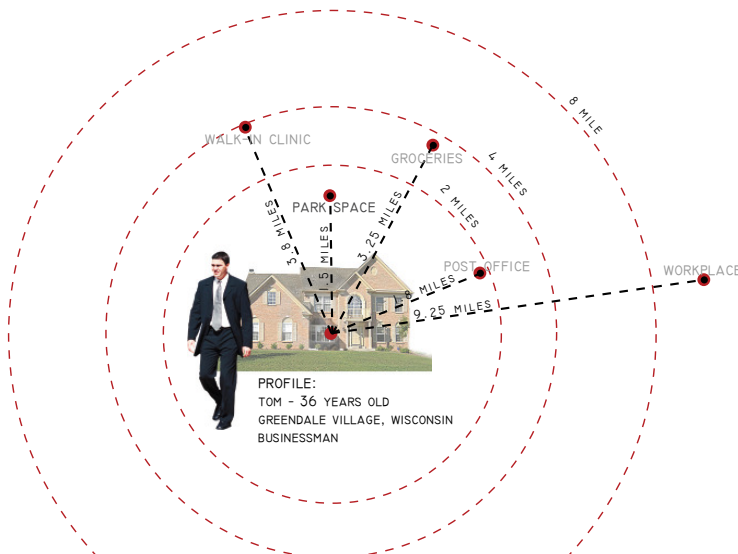
walking and bicycling are the main form of transportation within the development

reduced dependence on the automobile

connections to parking garages

-garages house car-share facility

-minimizes on-street parking



major project elements  
carbon conscious design

light rail transit station  
-light rail is the main form  
of travel to areas outside  
of the neighborhood

native plant  
palette

zero-energy building  
-optimally efficient  
-satisfies energy  
demands  
with on-site energy  
production  
-strict material palette

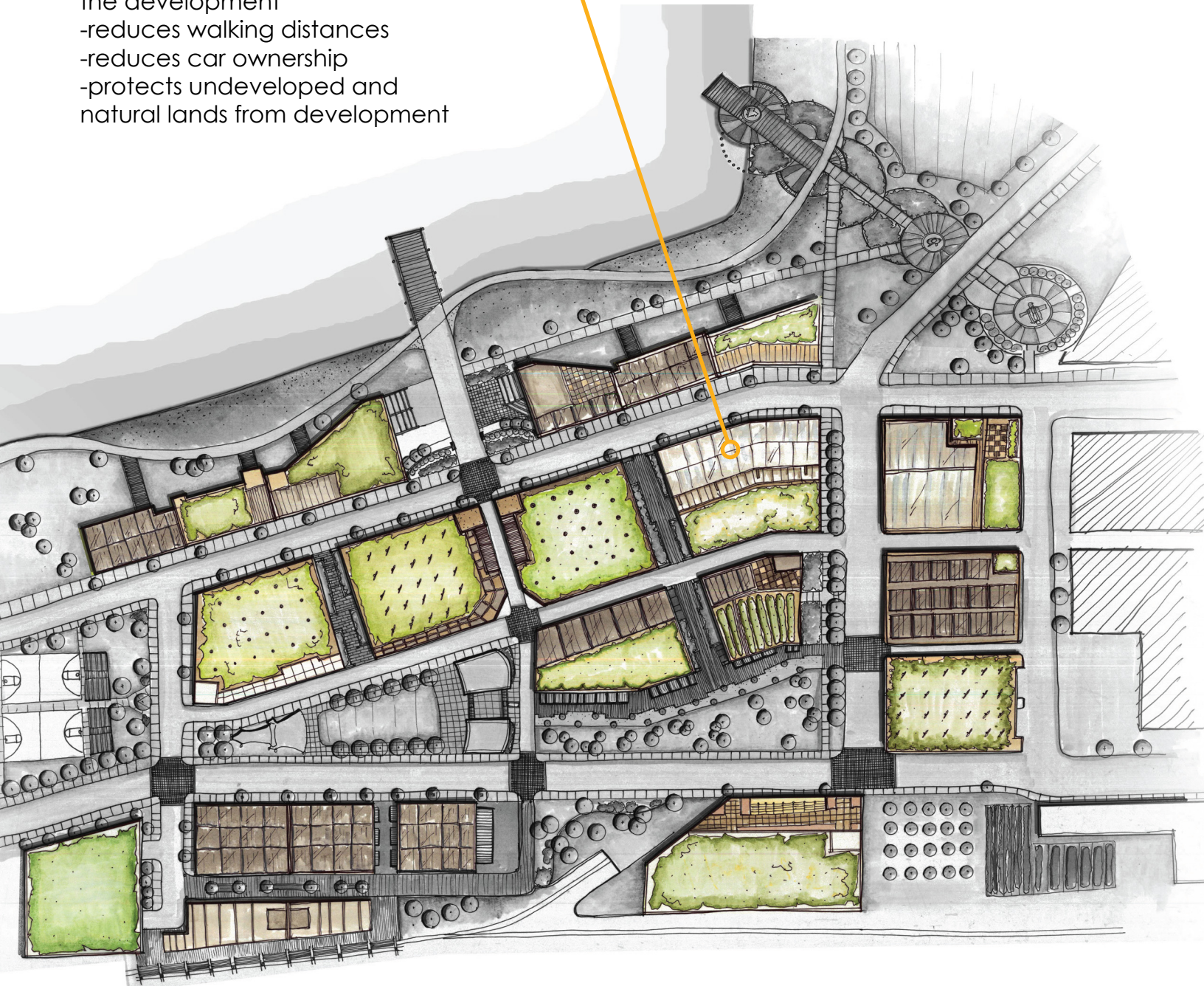


To allow for a light rail transit stop within Reed Street Yards, the effective density has more than tripled that of the development surrounding Reed Street Yards. It is known that in order for a mass transit stop to be economically viable within a neighborhood the density must at least double that of the surrounding development. This stop also follows Milwaukee's 2030 light rail extension plans. Reed Street Yards lies along a major extension corridor that utilizes the current freight rail lines that create the south border of the development.



## High Density Apartment/ Condo Living

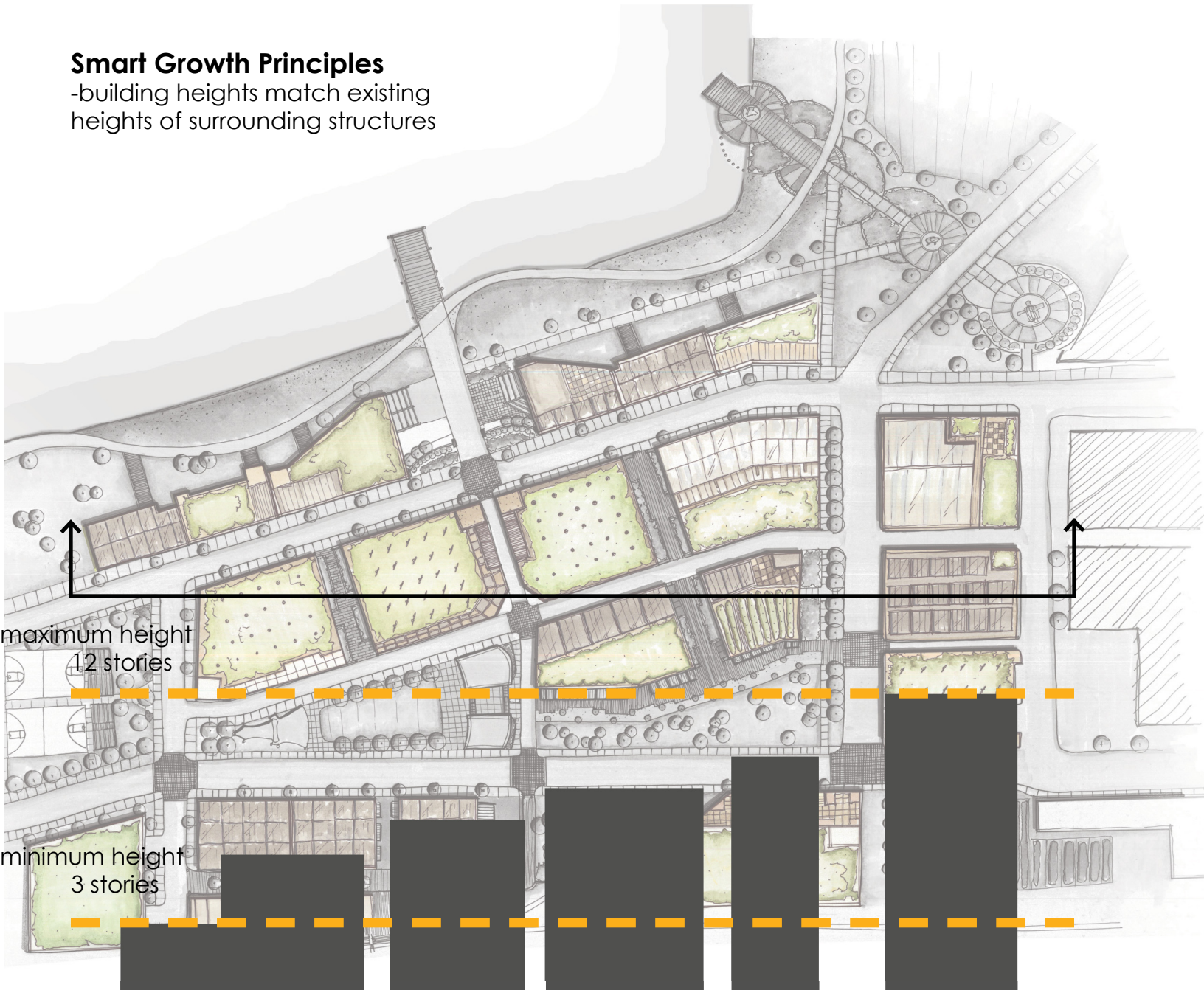
- creates a mix of social class
- supports diverse commercial and retail base
- allows for a light rail stop within the development
- reduces walking distances
- reduces car ownership
- protects undeveloped and natural lands from development





## Smart Growth Principles

-building heights match existing heights of surrounding structures

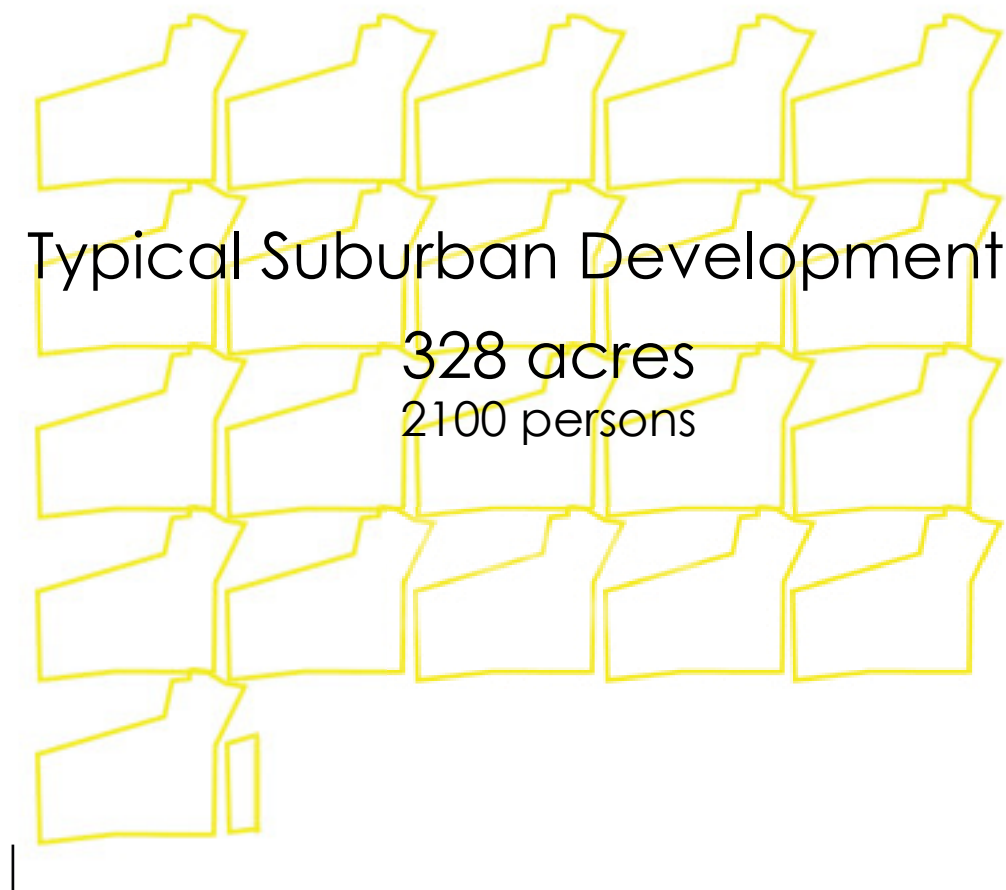


## Reed Street Yards

15.5 acres  
2100 persons

55 du/acre

## Typical Suburban Development



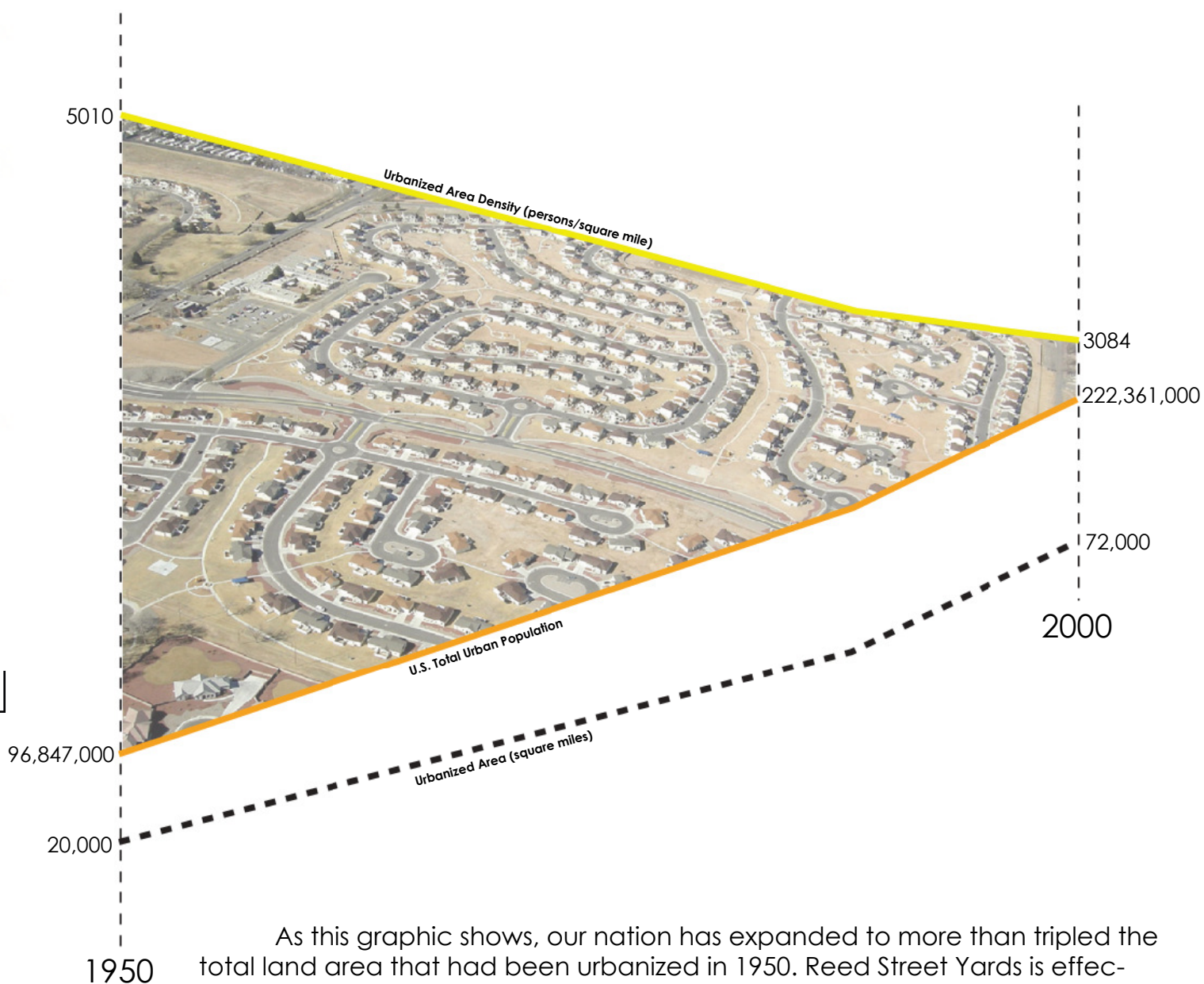
328 acres  
2100 persons

4 du/acre

3.2 du/acre  
Average Milwaukee density

To accommodate for the amount of people who would reside in Reed Street Yards, approximately 328 acres would be required in a typical suburban style development. In an effort to reverse our ever-expanding suburban sprawl, Reed Street Yards was designed for a density of 55 dwelling units per acre. A development designed in this fashion, can become a model for cities across the United States that struggle with similar sprawling suburban issues.

. major project elements  
compact urban design



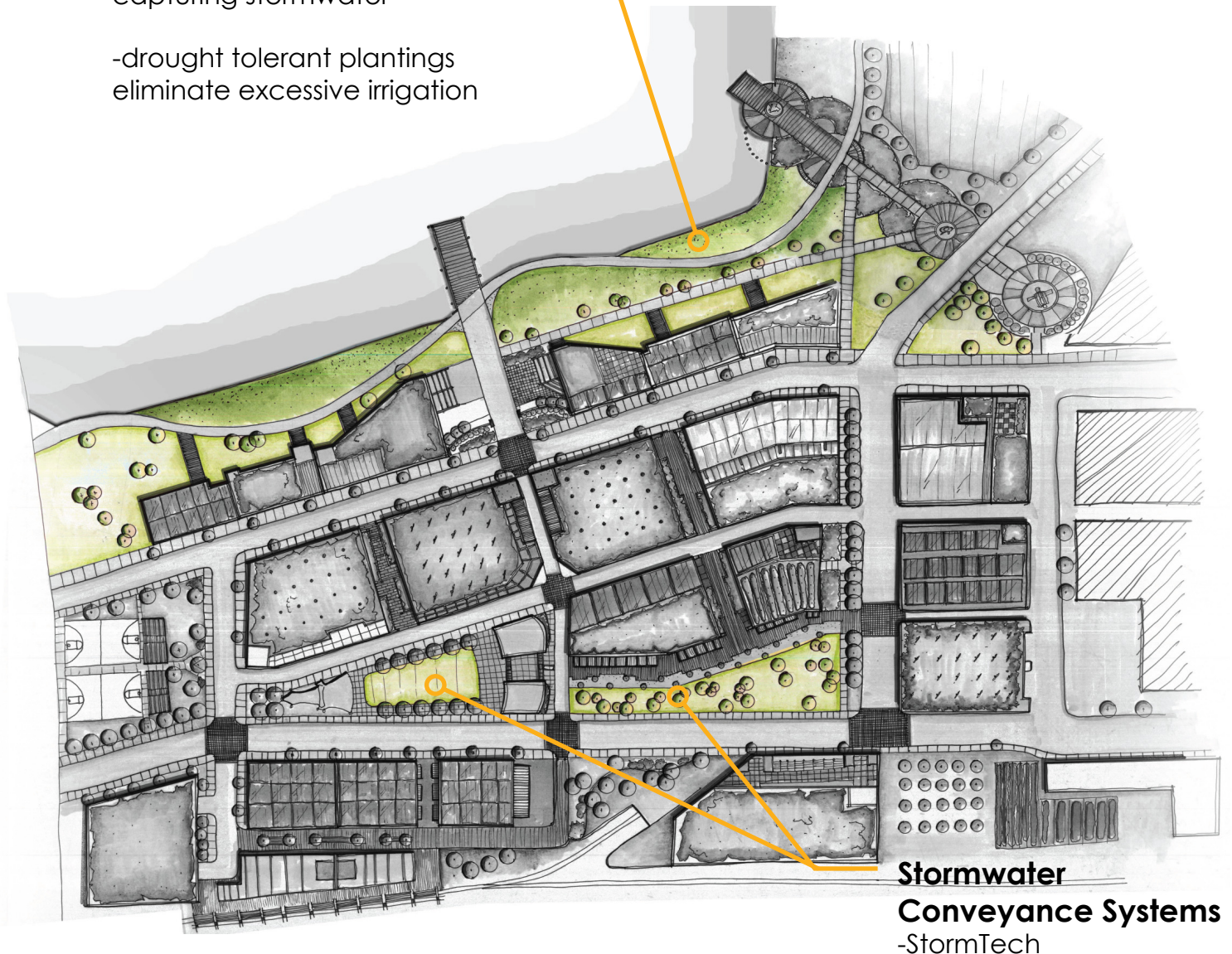
As this graphic shows, our nation has expanded to more than tripled the total land area that had been urbanized in 1950. Reed Street Yards is effective in that it had saved 328 acres of sprawling development. Using compact urban design methods, a city can drastically improve transportation systems. In cities that continue to sprawl, a mass transit system such as light rail may not be economically viable.



### **Native Vegetated Buffers**

- filters stormwater before reaching the Menomonee River
- materials, soils, and subsoils designed for filtration and capturing stormwater

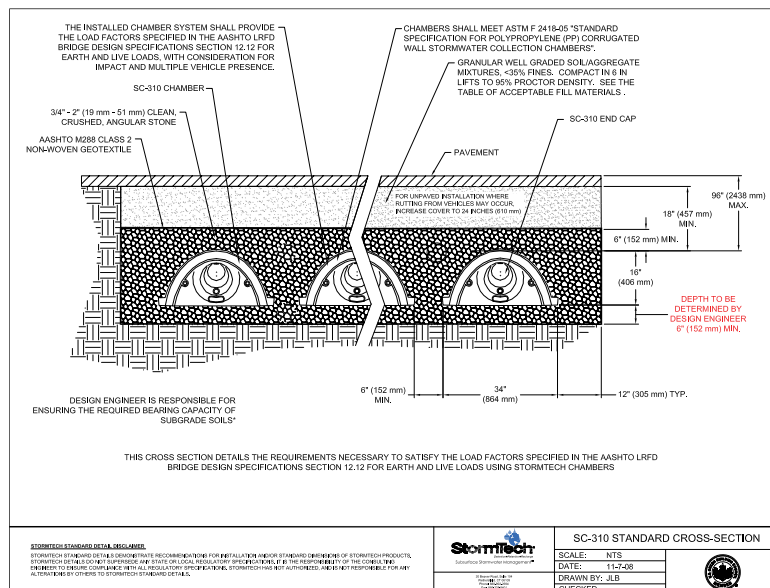
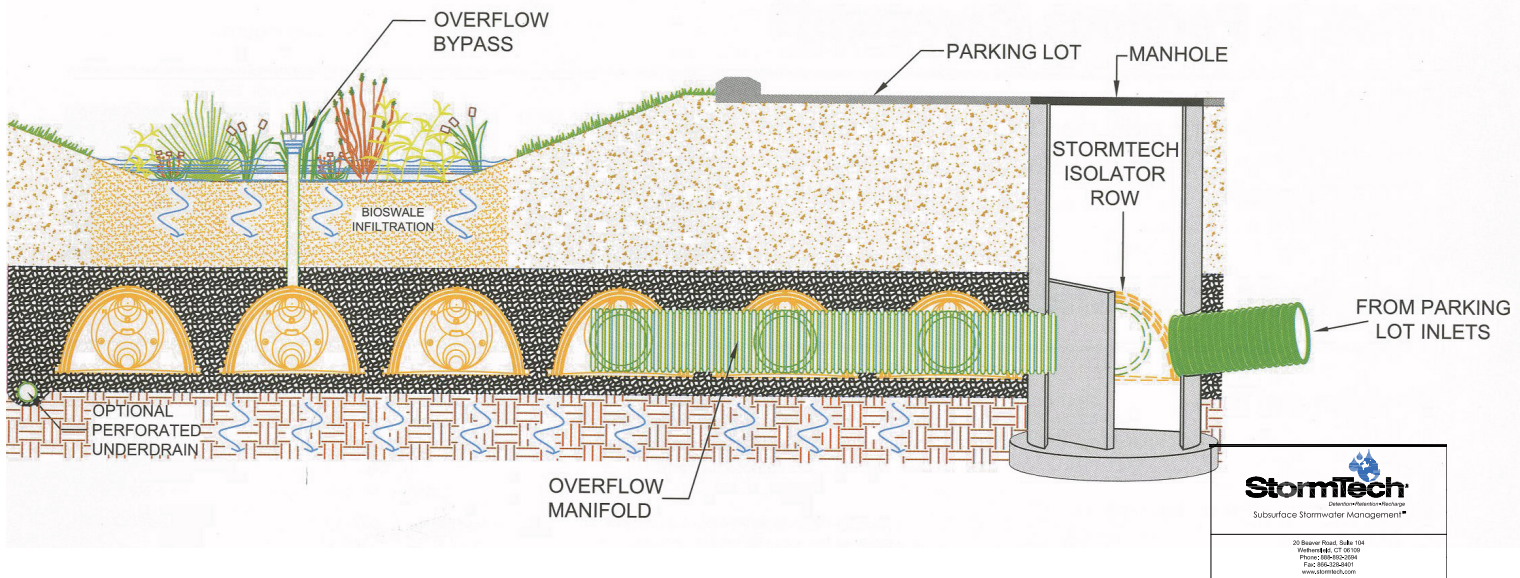
- drought tolerant plantings eliminate excessive irrigation



**Stormwater  
Conveyance Systems**  
-StormTech

. **major project elements**

landscape sustainability - stormwater management



## Benefits of the StormTech System

Removal Efficiency Results:

total suspended solids = 80%

phosphorous = 49%

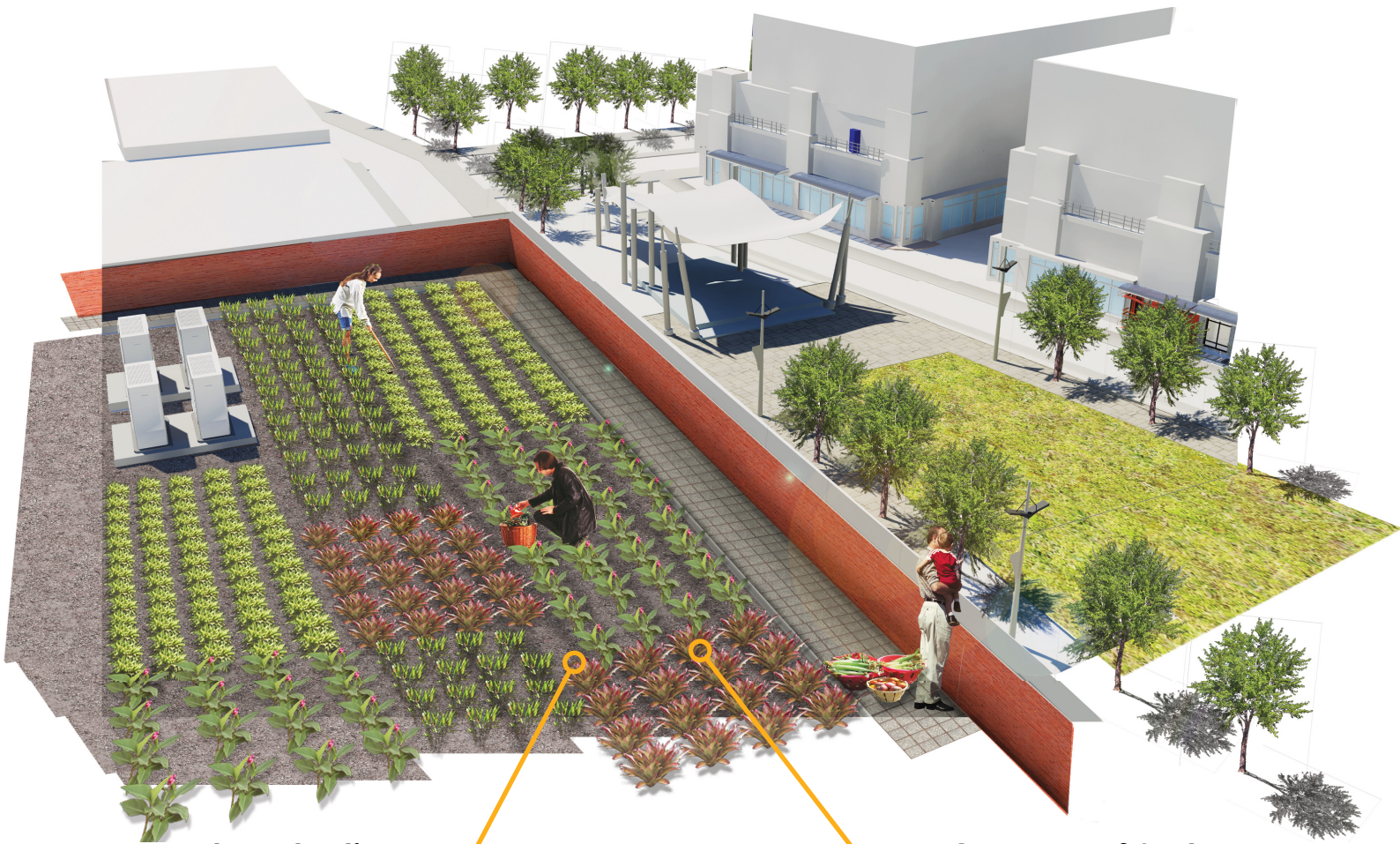
petroleum hydrocarbons = 90%

can use crushed recycled concrete as backfill

recharges groundwater

improves land use





### **Food Production**

- provides locally grown produce
- free of unnecessary pesticides, insecticides and fertilizers
- drastically decreases distance food travels

### **Green Roof Systems**

- collects and evapotranspires rainwater
- reduces runoff
- improves heating and cooling loads of the structure

. major project elements

landscape sustainability - stormwater management





### Hydroponic Greenhouse

- reduces water consumption to nearly 15% of what traditional agricultural consumes
- can utilize fish runs within system to further fertilize greens
- reduces grow time to a fraction of typical open air growth

### Green Roof

- reduces heating and cooling loads
- filters rainwater
- creates aesthetically pleasing roof top

### Permeable Paving

- moves water to vegetated areas
- excess water runs to roof drain then to StormTech system

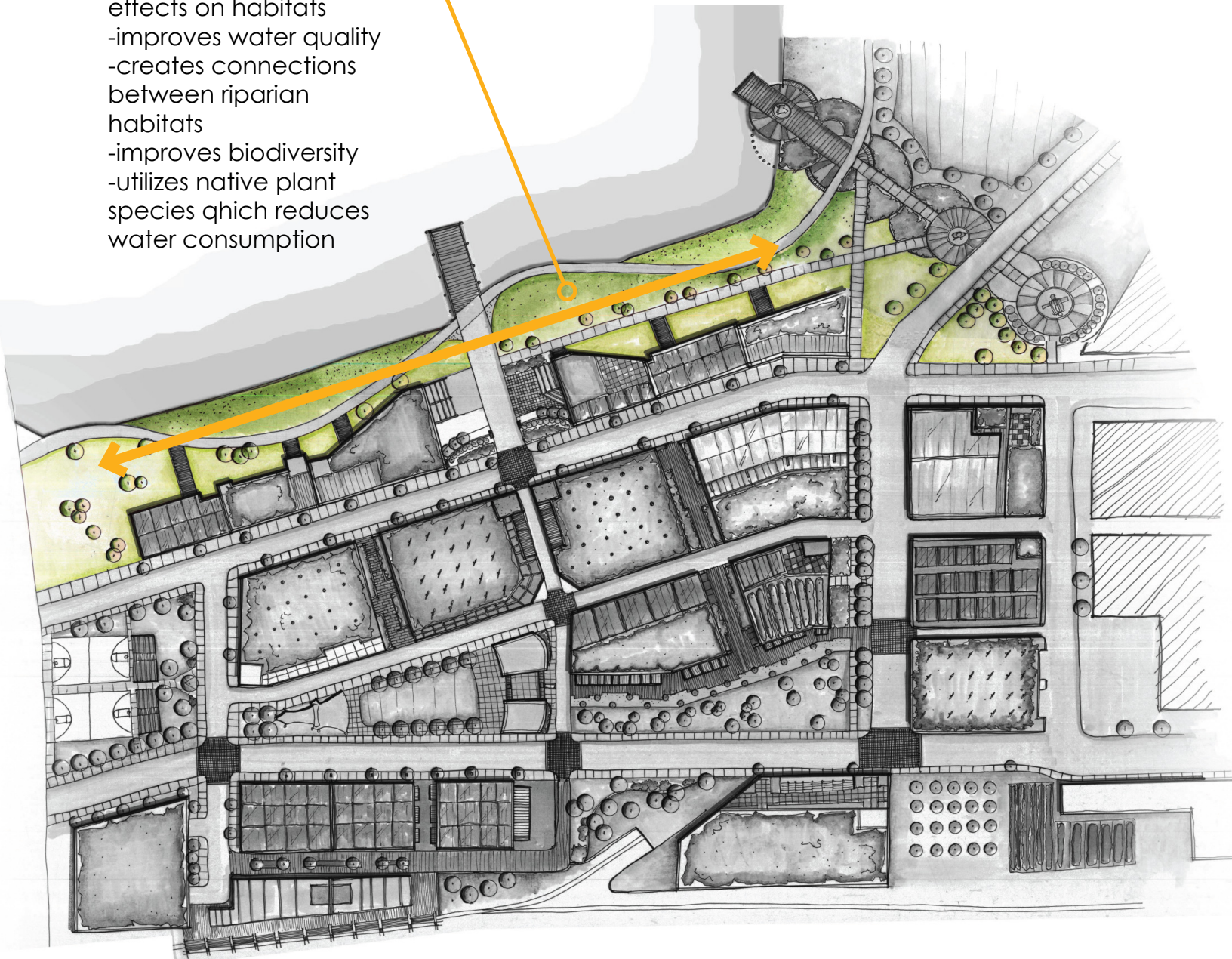
### Rainwater Collection

- reduces need for city water



## **Vegetated Buffers**

- minimizes adverse effects on habitats
- improves water quality
- creates connections between riparian habitats
- improves biodiversity
- utilizes native plant species which reduces water consumption



. major project elements  
landscape sustainability - natural landscape



## Vegetated Buffers

On the riverfront, sheet-piling has been used to maintain land mass. Since this canal is not used as a shipping corridor, it no longer needs to be dredged. The proposal would be to utilize the sedimentation that occurs as a reconstructed habitat.



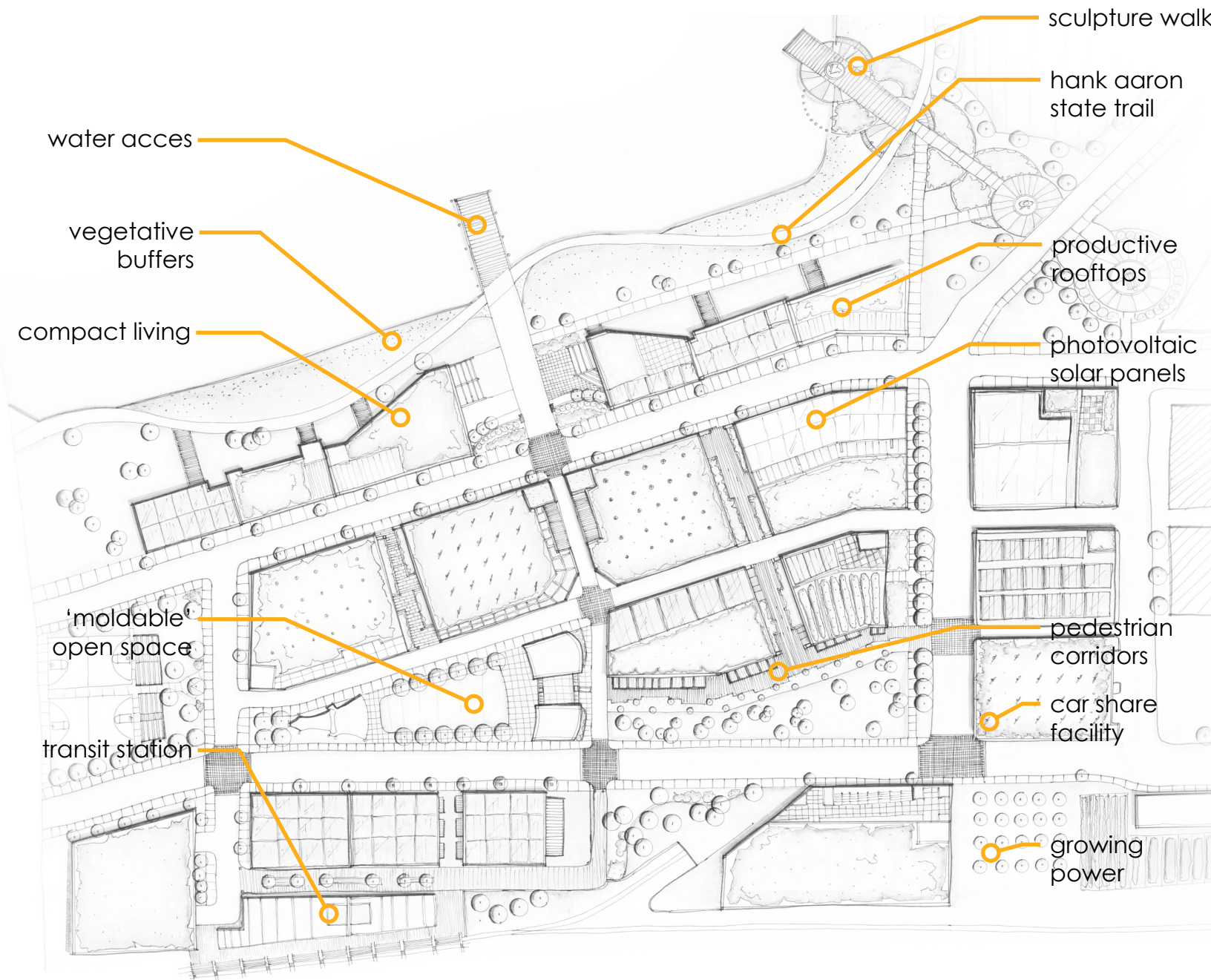
## Material Palette

Boardwalks and piers are constructed of a sustainably harvested weather-resistant wood.

. major project elements

landscape sustainability - natural landscape







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<http://www.urbanecology.org.au/publications/residentialenergy/images/cw2.jpg>

<http://www.abc.net.au/gardening/images/m1798106.jpg>

Kronsberg District:

[http://www.asla.org/uploadedImages/CMS/Business\\_Quarterly/kronsberg\\_interviewpage.jpg](http://www.asla.org/uploadedImages/CMS/Business_Quarterly/kronsberg_interviewpage.jpg)

[http://www.gardenvisit.com/blog/wp-content/uploads/2010/11/kronsberg\\_hanover1a.jpg](http://www.gardenvisit.com/blog/wp-content/uploads/2010/11/kronsberg_hanover1a.jpg)

Dockside Green:

<http://blog.emap.com/footprint/files/2009/12/dockside-green-33-water.jpg>

[http://pre.cloudfront.goodinc.com/posts/post\\_full\\_1278611656dockside-plan.jpg](http://pre.cloudfront.goodinc.com/posts/post_full_1278611656dockside-plan.jpg)

### **History:**

1 <http://www.wisconsinhistory.org/whi/fullimage.asp?id=6920>

2 [http://lh6.ggpht.com/padilla.collado/R9D4tiNjhjI/AAAAAAAAAyw/7nDuEASAUOQ/s400/harley-davidson\\_115.jpg](http://lh6.ggpht.com/padilla.collado/R9D4tiNjhjI/AAAAAAAAAyw/7nDuEASAUOQ/s400/harley-davidson_115.jpg)

3 <http://www.flickr.com/photos/repowers/1761842275/sizes/o/in/photostream/>



“North Dakota State University has been a great learning experience. For being a smaller school, I feel that there is a great wealth of opportunity to become involved in many different aspects of the academic environment.”

Bryan Leininger  
608 5th Ave. NE  
Kasson, MN

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